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Forestry Series

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Forestry in the Middle East and North Africa

An Implementation Review



Idah Pswarayi-Riddihough

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FOREWORD

The large rural populations in the Middle East and North Africa (MENA) region depend significantly on forest resources for income generation, fuelwood for energy and grazing for livestock, amongst a number of other activities. It is clear that development of forestry has the potential to alleviate poverty, encourage economic development, and achieve social equality (increased access to forest management and products, increased participation of all stakeholders), as well as protect the environment. Achieving these objectives presents a substantial challenge for the MENA countries and, by extension, for all agencies, institutions, civil society and other concerned stakeholders involved in forestry development. The challenge is even greater in this region given the scarcity of forestry resources.

To develop strategies that are cross-sectoral in nature, a first step to achieving these goals, requires substantive information. The purpose of this review was to gather background information of previous forestry programs in MENA and to determine how the Bank may contribute to addressing the issues of forestry development in the region. A principal conclusion of the review, supported by the results of the consultative workshop held in Tunisia in 2000, is that forestry must be considered in the broader context of natural resources, given its significant contribution to environmental and natural resource management. The review also represents a preliminary analysis upon which deeper economic sector work, as it relates to forestry, may be carried out. It is our hope that the review will also contribute to a much greater recognition of the importance of, and scope for developing strategy for integrated natural resource management in MENA.

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ABSTRACT

In the Middle East and North Africa Region (MENA), forest resources are generally limited as is their contribution to GDP. As a result, their importance is often overlooked or marginalized. However, their contribution to natural resource and environmental management is significant and although it is not easily quantified, it should not be under-estimated. This paper, which was carried out as an input to the development of a Bank Forestry Strategy to guide its work in the forestry sector, reviews the Bank-assisted forestry projects implemented in the MENA region over the last 10 years. It includes a definition of forests in the region, describes their current status, the related policy and economic issues, as well as identifies the involvement of the civil society and private sector in forestry. It also discusses the lessons learnt from past experience, how these lessons could be applied to improve future Bank support to the sector and eventually enhance the Bank's project portfolio. The paper highlights that, ultimately, the decisions taken on the directions to be followed by the Bank must be based on sound knowledge of the overall situation in the region and possible future Economic and Sector Work (ESW) themes are proposed.

The results of this implementation review were presented in Tunisia at a workshop carried out in February 2000, to seek client country feedback, identify critical issues and make recommendations for further analysis. The summary of these findings are in an annex to this paper. Overall, it is clear that beside developing appropriate policies and formulating adequate technical solutions, the local communities must be directly involved in the planning, implementation and monitoring of forestry development activities. This approach implies that the Public Administrations responsible for forestry development are fully decentralized to local levels and are capable of strengthening local capacity as well as encouraging local community participation.

This paper is intended for use by Bank personnel and others outside the Bank, who may have an interest in forestry and natural resource management in MENA.

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EXECUTIVE SUMMARY

The issues affecting forestry development in the MENA region are varied and complex in nature. And although some of these issues have been addressed at one time or another, they have rarely been dealt with in a holistic and comprehensive manner. The results and impact have therefore, been mixed. In any event, it is important to note that specific commitments on the client's part will also be required to create a conducive environment for forestry development in general.

Institutional and policy issues

In the MENA region, the planning, development, management and conservation of forests is under the responsibility of the public sector. However, public institutions often do not possess adequate capacity to carry out the required programs on a sustainable basis. For example, in Yemen, there are only a handful of trained foresters to manage forest resources. The fledgling system of protected areas, supported through a small GEF grant, means that the majority of Yemen's forest resources are without adequate funding for protection or management. The limited workforce available to work on forestry issues means that it is difficult to remedy this situation and land resources continue to suffer degradation, at least in the short term.

Moreover, forest management in the region is largely implemented through a top-down approach using policing methods rather than a collaborative approach. The latter is still in an embryonic stage and needs to be fully developed, adapted and institutionalized. Sustainable management is further constrained by rapid population growth. The current average population density in the rural areas is estimated to be more than 100 people per square km, of which a large proportion are considered to be poor. Furthermore, public awareness on issues related to natural resources and forests is very limited.

Public budget allocations to forestry institutions are generally small and insufficient, as emphasis has been placed on investing heavily in urban areas on infrastructure and housing, and in rural areas on water resources, rather than on integrating sustainable natural resource management with forestry activities. The Bank's Country Assistance Strategies (CAS) have also neglected the forestry sector, mainly because of its slow direct contribution to the countries' GDP. Virtually no ESW has been carried out to guide the Bank's lending in the forest sector in MENA.

Private sector involvement in forestry operations is still very limited, with the exception of forest products' harvesting and transformation. In some countries, such as Tunisia and Algeria, the private sector is also involved on a contractual basis in reforestation operations. To encourage increased private participation will require that appropriate policies and incentives that permit entrepreneurs to benefit from their participation are put in place. In the long-term, private participation should cover forestry operations on privately owned lands, assuming that adequate land reforms and incentives are put into place. This form of participation will become more important as the forested areas under public sector management are treated, leaving the bulk of the untreated areas (and under threat of degradation) in private hands.

With few public resources allocated to forestry development, forestry research is consequently constrained. Moreover, research centers are generally independent from forestry operations agencies and the limited coordination between them often means that research results are not adequately applied to forestry development. The forestry research centers set their own priorities which, with few exceptions such as in Morocco and Tunisia, are not always the same as those that would be considered by the forestry operations agencies.

Performance of the forest sector and role of the Bank's assistance

Annex 1 shows some of the region's project portfolio in forestry, natural resource management and biodiversity conservation. This is not an exhaustive list as it does not include projects that may have an NRM/forestry/biodiversity component, such as those in infrastructure, social safety net and water projects, nor those under preparation.

Implementation experience of forestry and natural resource management projects in the region has been mixed. The "new generation" projects – i.e. those that became effective in the mid-1990s and later - have fared better than the "older" generation projects. This has been partly due to the realization that encouraging local community participation leads to a higher potential for sustainability. The better results are also due to the fact that the new projects have built some institutional capacity allowing for improved project implementation, including more participatory and collaborative approaches. It has also become clear that the development and adoption of a participatory approach come with higher human efforts and financial costs: These costs have not been easy to back up and project design has tended to be slower and more labored.

The relatively short project implementation periods (normally five years), in the context of an otherwise long-term process, have also limited the impact, particularly as it has been difficult to put into place policy and legal changes within this time frame. Moreover, in most cases, remedial measures needed to reverse degradation could rarely be implemented over a five-year period. In fact, the long "gestation period" of such measures has often been a disincentive for Governments to invest in the sector. Furthermore, these Governments' budgetary situation is unlikely to get better soon and alternative complementary funding will be needed to continue supporting the sector. Although still negligible in comparison to other regions, funds from the Global Environment Facility's (GEF) have somewhat alleviated this problem. Biodiversity conservation projects have been/or are under implementation in Morocco, Yemen, Tunisia, Algeria and Syria.

The complex interaction of the already numerous issues affecting forestry has made project design and implementation more difficult. A case in point is the Land and Water Conservation Project in Yemen, where despite the fact that implementation was satisfactory and supported by a good project design, the results were limited because the project objectives were rather ambitious and spread over too large a geographical area. Although capacity building remains high among the Bank's objectives with regards to forestry development, this issue still remains a key limiting factor, particularly as Governments rarely want to borrow for technical assistance or training. However, it is important to note that lessons learnt from former projects were incorporated into the majority of the "new generation" projects. For example, in Morocco, lessons from the now closed Second Forestry Development Project have been used to improve project design in the newer Lakhdar Project, Protected Areas Management Projects and in the Integrated Forestry Development Project presently under preparation.

Recommendations

Economic sector work. A great deal still needs to be done to integrate forestry and natural resource management into the broader rural sector programs. To facilitate this integration, forestry must be seen in the broader context of sustainable natural resource management and also through its potential contribution to poverty alleviation, particularly in the rural areas. The issues affecting forestry development are varied and complex in nature (mainly population/livestock pressure, water scarcity and lack of public funding) and although some have been addressed at one time or another, they have rarely been dealt with in a holistic manner. Sound issue-oriented Economic Sector Work (ESW) should be carried out for two main reasons : (i) the client countries need help in formulating workable policies/strategies for dealing with their difficult forestry problems; and (ii) the Bank needs to have a better understanding of the forestry situation in the countries to better formulate its own strategy and modes of intervention.

Lending and financing for forestry. Lending should be based on the results of the ESW and be integrated as part of a longer term comprehensive development framework. The lending program for forestry would be influenced by: (i) the willingness of the client countries to engage in dialogue and borrow (mainly IBRD funds) for forestry development – including forest land management – resulting in long term benefits; and (ii) the competing claims for resources both within the client countries and the Bank. Lending for forestry development would probably have to be combined with grant allocations from bilateral donors and GEF in order to achieve the required results.

Partnership and alliances. There is an obvious need for close collaboration between stakeholders from the planning and design stages to the implementation and monitoring of forestry development activities. A concerted coordination effort between the various sectors whose activities have an impact on natural resource management is needed to develop sustainable strategies. This process has been slow because in many cases those responsible for rural development are not necessarily the same people responsible for forestry and natural resource management.

Additionally, partnerships with local communities and Non-Governmental Organizations (NGO) and the civil society must be fostered. Generally, local NGO have closer ties with local communities than decentralized Administrative agencies and they are therefore effective in raising awareness on natural resource management/forestry issues. On the other hand, they tend to have a limited impact because of their small size and limited funding. Partnerships with external (NGO) would also be important as they provide technical assistance, capacity building, and in many cases, also finance local operations. Such alliances are growing as evidenced by the presence of the Royal Conservation Society in Jordan and of the International Union for the Conservation of Nature in Tunisia. A World Wildlife Fund (WWF)/Forestry alliance has also been launched for the MENA region. Finally, partnerships/alliances also need to be fostered with other institutions involved in forestry development in other comparable countries.

INTRODUCTION

Purpose of the review

This regional review was carried out in response to the Bank's decision to conduct a Bank-wide Forest Policy Implementation Review (FPIRS) as a key input to the development of a Strategy to guide its work in the forestry sector. The review was also initiated as a result of the Bank's recognition of the need to place its role in forest activities in the context of other stakeholders engaged in the forestry sector. The review does not cover work already dealt with by programs such as *the Mediterranean Forest Action Programs* or various ongoing initiatives under the IFF sponsored "*National Forest Programs*". It was designed to solicit input and advice from a range of stakeholders so that strategy development would be grounded in real transparency and engagement with interested parties. More specifically, the objectives of the implementation review were to:

- listen to and consider views of all key forest-related constituencies and ensure that they have reasonable opportunity for involvement in the policy review and strategy development process;
- identify the broader set of issues that impact on forest resources in Bank client countries and related sectors, including consideration of alternatives for addressing these issues;
- assess stakeholder perspectives on the Bank's comparative advantage as an input to developing an appropriate strategy; and
- contribute to the building of consensus on a global strategy which would involve all stakeholders in preserving and managing forests in the context of sustainable development and poverty alleviation.

The Bank review was carried out in three phases:

- (a) *Phase One - Stakeholder issues meetings*, whose primary purpose was to gather and distil stakeholder perceptions of key issues and options.
- (b) *Phase Two – consultations*, which involved the compilation and synthesis of findings from the regional assessments, analytic studies and feedback from stakeholder issues meetings, reflecting a diversity of views particularly on controversial issues. These were also shared widely with interested stakeholders during a series of regional stakeholder consultations which were convened to assess and provide feedback on the above findings. Specifically, the consultations were seeking to resolve differences in views and examine the World Bank's role in terms of (a) areas where the World Bank should focus its efforts, and (b) areas where the World Bank should work in partnership with others. The MENA workshop was held in Tunis between February 23-25, 2000. Input and Feedback from the consultation meeting is reflected in this review and the report prepared for the meeting is available at the Bank. A summary of the workshop findings is included as an annex to this review. Broadly, the workshop covered the following issues :
 - what are the priorities for investment in forestry/forest land use at the regional and national levels?
 - what should be the World Bank's investment strategy to supporting these priorities: - how much? what role? with what kind of partnerships and alliances?
 - client countries – World Bank: what conditions for lending?
- (c) *Phase Three - draft strategy consultations*. Input and feedback from the consultations have been reflected in a strategy document prepared by the World Bank which will also take into account Operations and Evaluation Department (OED) country case studies and any further findings from

its review. This document will form the basis of the World Bank's proposed strategy and will be widely disseminated and discussed with key stakeholders.

As part of this consultative work, the MENA region was requested to carry out a review of its past and present portfolio to provide the review process with its key forestry/natural resource management issues, experiences, and recommendations for future Bank-assisted work.

Forestry in the MENA Region

The MENA Region, as defined in this paper, covers nine countries: Algeria, Egypt, Iran, Jordan, Lebanon, Morocco, Syria, Tunisia, and Yemen, split into the MAGHREB: Algeria, Morocco and Tunisia which are French speaking and the rest into the MASHREQ which are English speaking.

Role of forests

Of all the regions supported by the Bank, the Middle East and North Africa (MENA) region is the one with the least forest and wood resources. Where high value forests once existed, such as in the Atlas and Lebanon, over-exploitation over extended periods has greatly reduced their quantities and value. Some very high quality forest resources are still found in the region, but a large part of these resources are not for commercial use. Historically, the limited availability of forestry resources has been the prevailing situation for a large number of the countries, as illustrated by accounts written on ancient Egypt. Although, there were large quantities of palm trees, fig wood and acacias, Egypt has never possessed much valuable wood, and plantations have been limited by the dry climate. Egypt became an exporter, mainly of cedar for ship and house building, from as early on as 2650 BC from the present day Lebanon. When this source of wood was cut-off by wars Egypt planted numerous trees in the south on both sides of the Nile sustained by irrigation, and although their conservation was given a high priority and was strictly enforced, these trees and any others that were available were subsequently harvested for revenue generation both legally and illegally.

Forest production (including species diversity) is limited by several key factors, of which water scarcity, nutrient poor and degraded soils are the most significant. In fact, with only a small area receiving adequate rainfall for forest growth, most of the region is characterized by a semi-arid or arid climate which is unsuitable for dense vegetation growth. The forests include dense broad-leaved evergreen Mediterranean types with areas of warm-temperate mountain forests, woodlands, shrub-lands and esparto grasslands.¹ By far their most important contribution is in terms of natural resource and environmental conservation, a role which is significant in the overall context of rural development. These forests also play a key role in watershed management, flood and erosion control. The overall economic costs of environmental degradation can be very high. In Algeria, for example, these costs are estimated at around \$4 billion per year or around 9 percent of GDP. This figure is expected to increase to \$35 billion per year in 10 years unless measures are taken to arrest and reverse the negative trend. Of the current \$4 billion per year, it is estimated that approximately \$300 million per year are lost due to soil degradation alone. On the other hand, estimates including benefits foregone (e.g. through reduced soil productivity, health related problems from pollution and poor water

¹ The term forests in this paper will be used to refer to both commercial type timber, such as that found in pure stands of natural or planted forests, and to mixed woodlands, shrub-lands, plantations along watersheds, esparto grass and other permanent pastures, and rangelands.

quality, loss of biodiversity etc.) amount to close to 80 percent of GDP over 10 years (15 percent over 20 years) in total, or 9.3 percent of GDP/year².

In addition, the forests in the region contribute to poverty alleviation through the provision of a wide array of forest (wood and non-wood) products, which generate additional sources of income for many communities living in and around the forests. Therefore, forestry cannot be considered as a stand-alone sector, but rather as an integrated element of natural resource management within a broader landscape approach to sustainable rural development. Development indicators for the nine countries under consideration in the MENA region are presented in Table 1.

Table 1: Development Indicators of the Bank client countries in the MENA region

Country	GDP million US\$	GNP US\$/capita	Population Million	Population Growth %	Urban Population % of total	Rural Pop. Density per sq. km
Algeria	47,072	1,500	29	2.2	57	166
Morocco	33,514	1,260	27	1.7	53	145
Tunisia	18,937	2,110	9	1.5	63	119
Egypt	75,605	1,200	60	1.8	45	1,167
Iran	89,979	1,780	61	1.7	60	137
Jordan	7,015	1,520	4	2.8	73	378
Lebanon	14,962	3,350	4	1.7	88	264
Syria	17,899	1,120	15	2.6	53	153
Yemen	5,656	270	16	2.6	35	714

Source: FAOSAT Database 1998-99.

Major factors affecting forests

Despite their vital role in sustainable rural development, there is enormous pressure on the forests from a large and ever-increasing rural population and livestock herds. Deforestation and the decline in forest quality, caused by population pressure coupled with weak conservation and soil management techniques, result in severe soil erosion and ultimately degradation and desertification. The importance of managing the forest resources on a sustainable basis and reducing the incidence of forest degradation has been recognized in most of the countries, as evidenced by the inclusion of these issues in the countries' development plans. However, because of the severity of water scarcity in the region, public investments and subsidy programs have tended to focus on water resource development, often neglecting the use of an integrated watershed management approach. A renewed focus on poverty alleviation in the region should lead to more emphasis on integrated resource management, erosion reduction and maintenance of the vegetative cover (woodlands as well as forests).

Forestry and cross-sectoral linkages

The forestry sector has linkages with several sectors, in particular agriculture, water, environment and tourism. As the major limiting factor in forest development is water scarcity, the need for collaboration between the forest and water sectors is important. The largest share of water supply is for human consumption, with a large part of the remainder being used for agricultural irrigation. The ability to irrigate and carry out agricultural production in drier areas, coupled with incentives to produce more, such as high prices of agricultural produce, encourage the conversion of forested lands to agriculture. To stop and/or reverse this trend, joint sector

² *Plan National d'Actions pour l'Environnement et le Développement Durable (PNAE-DD). Ministère de l'Aménagement du Territoire et de l'Environnement (January 2002).*

strategies will need to be developed for the purpose of increasing agricultural productivity while avoiding undue forest conversion and degradation.

In addition, the forestry sector has linkages with the tourism sector through its recreational uses. In some countries, the importance of ecotourism is significant, such as in Morocco, Tunisia and Lebanon, where many of the forests are part of national parks and attract large numbers of people. Development of the tourist industry, as is being carried out in Morocco, should ultimately be beneficial to both the forests and the economy. The remaining natural forests also play an important role in biodiversity conservation. Some of the ecosystems are unique and their preservation is vital from a global perspective – for example : the juniper and oak forests, the unusual flora (including 23 endemic species) in the Toubkal National Park, and the unique Rif, Middle-Atlas, High Atlas, Saharan Atlas found in Morocco³.

Forestry and the broader rural economy

A large part of the rural populations in the region are poor and dependent on forests as their major fuel source. In some parts, firewood represents 80 percent of fuel consumption. Forests are also an important source of livestock feed, and other non-wood products – such as honey, medicines, nuts, bark, fruit collection and they provide useful supplements to household incomes. To reduce pressure on forest use for firewood, it will be necessary to develop national energy policies in a broader context to include their impact on fuelwood use. This is a challenging task considering that the distribution channels for firewood, unlike those of fossil fuels, are not organized formally. National policies would need to include incentives in using alternative energy sources that are accessible, acceptable and feasible for use by the concerned communities.

³ Plan Directeur des Aires Protégées, 1996.

STATUS OF FORESTRY IN THE REGION

MENA has generally been left out of any priority planning for forestry, mainly because the quantity of forests in the region are low. It was not included in the 1991 Bank Forestry Strategy and the CASs have also largely neglected the forest sector because of its slow direct contributions to the GDP of the concerned countries. Despite this, the Bank has continued to invest in the region, and it has financed at least three stand-alone forestry projects since the 1990s, in Morocco, Tunisia and Algeria, and several natural resource management projects which include forestry in various countries. The low profile of forestry operations in the region has also been re-enforced by the fact that plantations have rarely performed as expected (i.e., they have not increased the supply of high quality commercial timber), mainly because of the poor soils and limited rainfall. The quality of the plantations has generally been poor and the species that can perform well in the harsh conditions of the region have been those that are not highly productive. Overall, the experience with forestry projects has been mixed with some projects achieving the expected goals and others not performing so well.

Although the Bank has been lending to agriculture in the MENA region for a relatively long time, lending for forestry has been more recent – since the early 80s. The need for forestry projects became apparent when degradation and conversion of forested lands to agriculture was reaching alarming proportions and causing significant environmental problems. By and large, the Governments also felt that they could, with enough hectares planted, reduce timber imports. Accordingly, the tree species selected for plantations were primarily for producing timber - eucalyptus and pines. However, it became evident that the will to plant and the budgetary allocations were not the only ingredients necessary for attaining this goal. Water was a significant limiting factor and in many cases the plantations were in areas climatically not suitable for commercial tree planting. The returns to the Governments were lower and slower than had been expected.

It became apparent, therefore, that “pure forestry plantations” for the production of sawn-timber, although viable in some places, were not profitable. The Governments’ approach then shifted from commercial timber production, as the sole objective, to a more multi-objective focus. Natural resource management/conservation became the central focus, and forestry production and management were among the objectives. With this approach, the projects could include timber production where feasible, while at the same time the functions of environmental protection were also fulfilled. This has renewed interest in the forestry sector and, in many cases, policies have been revised to include natural resource conservation as a central objective. This shift to natural resource management also highlighted the importance of involving local communities as it became apparent that only with their participation could the potential for sustainability be increased. Results from this new focus are still relatively recent, but on the whole, “participatory-based management” is promising as was found for example, in the Matrouh project in Egypt, the Northwest Mountainous Areas Development Project in Tunisia and the Rural Employment Project in Algeria. The participatory approach itself is still to be truly institutionalized, but significant steps have been made to adopt it as a strategy for achieving longer lasting effects with investments in forestry/natural resource management.

The review addresses the specific forest issues in MENA’s two sub-regions: MAGHREB and MASHREQ. The MAGHREB sub-region covers, Algeria, Tunisia and Morocco, while the MASHREQ sub-region covers, Iran, Jordan, Lebanon, Egypt, Syria and Yemen. Iran is a special case within the MASHREQ region, as it still possesses large extends of woodlands and trees in the northern part of the country. Estimated land areas, rural population densities, permanent pasture as a percentage of land area, forest cover, annual deforestation and average changes in forest cover in the two sub-regions are presented in Table 2 below.

Table 2: Forest statistics on the Bank client countries in the MENA Region

Country	Area	Permanent pasture	Forest and wooded area	Annual deforestation	Average % change in forest cover (1990-1995)	Rural Pop. Density
	000' ha	000' ha	000' ha	million ha		per sq. km
Algeria	238,174	34,467	3,982	0.023	- 1.2	166
Morocco	-	21,000	8,970	0.012	- 0.3	145
Tunisia	16,361	4,000	668	0.003	- 0.8	119
Egypt	100,145	-	34	0		1,167
Iran	163,319	44,000	11,437	0.028	- 1.8	137
Jordan	8,921	791	70	0.001	- 2.5	378
Lebanon	1,040	16	80	0.005	- 8.1	264
Syria	18,518	8,285	484	0.005	- 2.2	153
Yemen	52,797	16,065	2,000	0	0	714
Total		128,624	27,725	0.077	- 1.88	

Source: FAOSAT Database, 1999.

MAGHREB

Major characteristics of the Region

Physical and production: The most common species in the sub-region are pines (Aleppo pine in the drier areas and maritime pine in the moister areas), oaks (cork and zeen) and a mixture of holm oak, at altitudes up to 1000-2000m, thuya, cedar (to altitudes of 1400-2200m), the rest being maquis esparto scrub and dry woodland shrubs⁴. Forest areas range in size from 6,000 sq. km in Tunisia to 38,000 sq. km in Morocco. In the three countries, the quality of forests falls from north to south and west to east, a clear function of the rainfall pattern. In the north, the soils are also much richer and trees growth better. Significant systems of wetlands exist in some of these forests and although some are protected, several remain unprotected.

There has been substantial forest plantations carried out in the three countries, mainly with coniferous species (pines and cypress), eucalypts and other hardwoods. Eucalypts are used for pulp and paper making, while the conifers are used for sawn timber. A large portion of these forests are still relatively young, and necessitate high silvicultural maintenance costs borne almost entirely by the respective governments.

Forests in the region have suffered from fires, a situation worsened by the long dry summers. In addition, the Algerian forests have suffered significantly due to the civil unrest in the country. Reduced accessibility due to the conflicts has limited major reforestation and maintenance activities.

Economic characteristics: The role played by forests in the economies of the MAGHREB countries is limited from the view point of their contribution to GDP. However, forests contribute to the economy through: (i) environmental protection including watershed management, (ii) protection of agricultural lands, (iii) provision of firewood and other non-wood products, and (iv) provision of grazing.

Environment and watershed management. Limited vegetation cover is resulting in high rates of soil erosion. In particular, when watersheds are not protected the soils washed downstream cause siltation of dams, barrages and important waterways, reducing further the amount of water available. Of note are estimates made

⁴ Tunisia First and Second Forestry Development Projects Staff Appraisal Reports

for Algerian dams showing an average life-span of dams at around five years, where watersheds have remained unprotected⁵.

Protection of agricultural lands. Agricultural lands are often lost to erosion due to limited plant cover. This phenomenon, coupled with limited agricultural inputs, poor techniques and inadequate management of the soils, means that fertile soils with high agricultural potential are lost, generally at alarming rates each year. In 1993, it was estimated that three million hectares of Tunisia's agricultural land was threatened, of which half was already badly degraded.

Firewood collection. Firewood collection, as a source of energy and revenue from its sales, is very important for the majority of the populations that live in and around the forests. The extent of collection differs by country, but roughly over 50 percent (34 million people) of these populations are entirely dependent on firewood as an energy source.

Other wood and non-wood products. Although the three countries are net importers of forest products, they do export some forest products such as cork. In 1996, it was estimated that Morocco's wood and non-wood exports amounted to \$57 million (imports were \$329 million) whereas those for Tunisia amounted to \$16 million (imports were \$173 million).

Provision of grazing. Livestock production is an important part of the forestry production system. In Algeria, if the Sahara is excluded, forests are estimated to cover 15 percent of the country with an additional 15-20 million ha of suitable grazing area, esparto scrub and shrubs⁶. At least 40 percent of the forested areas in Morocco are grazed. In Tunisia the forest and scrub-land grazed is estimated at 0.7 million ha. Livestock production is a main economic activity, both in high rainfall areas where it represents a secondary production system, but more so in areas of limited rainfall where, in many cases, it represents the primary source of revenue. Livestock production provides insurance when crops fail. In addition, goats are a preferred source of protein as they are more readily transportable. The table below illustrates the importance of goats and sheep in the sub-region, as estimated in 1998.

Table 3. Statistics on the key livestock in the MAGHREB region, including their meat and milk production

Country	Algeria	Morocco	Tunisia
Goats (mil. Heads)	3.1	6.2	1.3
Goat meat (metric tons)	8.5	20.0	7.1
Goat milk (metric tons)	145.0	35.0	12.0
Sheep (mil. Heads)	16.8	14.8	6.6
Sheep meat (metric tons)	497.6	492.3	181.4

Source: FAOSAT Database, 1999.

In 1995, it was estimated that livestock contributed for at least 50 percent of the agricultural GDP in Algeria, 30 percent in Tunisia, and 26 percent in Morocco⁷. As forests serve as an important source of nutrition for

⁵ Plan National d'Actions pour l'Environnement et le Développement Durable (PNAE-DD). Ministère de l'Aménagement du Territoire et de l'Environnement (January 2002).

⁶ World Bank study: Rangelands Development in Arid and semi-Arid Areas Strategies and Policies, 1995.

⁷ World Bank study: Rangelands Development in Arid and semi-Arid Areas Strategies and Policies (1995)

these animals, it is safe to assume that the indirect contribution of forestry to the countries' GDP is significant. However, it is also important to note that forest grazing is in fact a free good for the livestock producer although it carries an economic cost. Hence, the net contribution would be lower if forest degradation were taken into consideration.

Recreation. Forests also have an important recreational function, particularly in those countries where they are part of national parks, and tourism is significant such as, in Morocco and Tunisia. In some of these countries, for example, Morocco and Tunisia, tourism is a major development objective and forests are considered an important element of their strategy.

Rural employment. Forests are not a large direct creator of rural employment *per se*, but through their protection of agricultural land, their indirect contribution is significant. In Tunisia, agricultural activities, including forestry have been estimated to employ at least 25 percent of the population⁸. The MENA region supports a population of 296 million people⁹, and approximately 120 million of them live in rural areas. Of these, about 84 million are dependent on agriculture - including fishing and livestock¹⁰.

Institutions and policies. In Tunisia and Algeria, forestry is the responsibility of Forestry Directorates in their respective Ministry of Agriculture. This was also the case in Morocco but in late 1997 the Directorate was elevated to a Ministry. The forest policies state the multipurpose function of forests. These policies are generally implemented through five-year plans. In all cases, forestry development on state and private lands, as well as watershed management, are the responsibilities of the national forestry agency and are funded directly by the Government. Private sector participation is minimal and limited mainly to forest exploitation which is generally carried out by a different Directorate than that for forestry development. In most cases, timber is sold standing through concessions with the price being determined by the relevant Directorate.

Existing policies in the countries are not always conducive to encouraging private sector participation. For example, there are restrictions on the utilization of trees once planted, and, in addition, permission must be sought from the Government to carry out forest plantations. Furthermore, for the private sector to qualify for contracts to carry out reforestation work, they are often required to have access to forest tree seedlings which is generally difficult because most forest nurseries are Government owned and do not sell seedlings to private enterprises.

On the issues of implementing institutions and community participation, there is still a lot to be achieved to fully adopt, develop and institutionalize the participatory and collaborative forest land use approaches. This is going to require that the institutions are adequately staffed and trained to deal with issues that are key in forestry/natural resource management. The MAGREB region, in particular Tunisia and Morocco, has realized the importance of including community participation to enhance the sustainability of investments. As such, they have conducted several pilot studies to foster the adoption of this strategy. However, institutions will still need adequate capacity to streamline the process into their planning, design, implementation and monitoring of forest/natural resource management.

Research is usually carried out by a separate Directorate which is to some extent "linked" to the main forest agency. However, the research topics do not always reflect the priorities of the implementing agency and the results from research are therefore rarely directly applied. Subsequently, research is given a lower priority and accordingly, the funding is limited. Several forest development technologies have been used, tree planting using vegetative techniques, contouring, terracing etc, with varying adoption rates and mixed success. Part of the difficulty has been to adapt the technologies to specific areas, taking into account human and financial

⁸ World Bank : Northwest Mountainous Areas Development Project Staff Appraisal Report.

⁹ Including Algeria, Egypt, Iran, Iraq, Jordan, Lebanon, Libya, Morocco, Oman, Saudi Arabia, Syria, Tunisia, Yemen, West Bank and Gaza.

¹⁰ FAO, Farming Systems and Poverty (2000)

resource availability. Technologies tend to be viewed as an extra input expense which does not have immediate returns and technical centers such as the International Center for Agricultural Research in Dry Areas (ICARDA) could provide assistance to the research institutes on issues of inter-cropping systems and rangeland development.

MASHREQ

Major characteristics of the Region

Physical and production. The diversity of climatic, topographic and soil characteristics in the MASHREQ creates a rich array of ecosystems, including, coastal, mountainous, and semi-desert systems. The forest ecosystems range from dry shrub-lands to lush monsoon forests. As in the MAGHREB, the quality of the forest cover is low, a result of the limited rainfall. These ecosystems carry a variety of forest species: from the semi-humid forests of ash, oak, elm, pistachio and walnut; lush deciduous forests of elm, oak, and beech, fir, cedar; junipers, maples and pines; maritime mangroves, wadi, desert shrubs and savanna. In addition, these countries also possess considerable biodiversity resources. For example, Iran, which among the southwestern Asian countries, possesses the most diversified biodiversity in the sub-region.

Some plantation forestry has been carried out, although the extent in each country is not easily determined. These plantations were established for timber production to substitute high imports, but in many cases the limited rainfall has limited growth and quality of timber.

The forests have suffered severe deterioration from urban and agricultural expansion, overgrazing, extensive fuelwood and charcoal collection. The conversion of forest lands to agriculture is also fueled by subsidized agricultural inputs.

Economic characteristics. As was the case for the MAGHREB, the role forests play in MASHREQ countries' economies is limited, if examined from the view point of their contribution to GDP. Exact figures are not known as they are rarely calculated separately and are generally lumped in as part of the contribution from agriculture. However, the value of the forests in terms of their environmental protection, protection of agricultural lands, the provision of firewood and other non-wood products, their contribution as grazing lands and to watershed management and employment is significant.

Environment and watershed management. The decreasing forest cover, erosion and eventual losses of soils are significantly affecting the forest's capacity to adequately protect the watersheds and environment in general. The result is siltation of dams and major waterways, reducing further the amount of water available. For example, the destruction of terraces, in Yemen, which have been key in reducing soil loss is resulting in a serious land loss problem.

Protection of agricultural lands. Land degradation in the MASHREQ is as severe as in the MAGHREB. Degradation is worsened by the continual destruction and reduction of vegetation cover and the use of inappropriate technologies. Irreversible land losses in Yemen have been estimated at $2\text{Mm}^3/\text{yr}$, a value which could be halved by increasing forest cover to 25-30 percent on the western slopes of Mount Lebanon.

Firewood collection. Firewood consumption relative to available resources is high. For example in Iran, it is estimated that over 6 million m^3/yr are harvested for firewood. Firewood production makes up at least 70 percent of household energy in Yemen. If a monetary value were assigned to this consumption, it is clear that the figure would be significant in terms of contribution to the GDP, although the users bear no financial cost except perhaps for transportation.

Wood and non-wood products. Non-wood products, as in the MASHREQ countries, have been estimated to contribute significantly to the revenues of the populations dependent on these resources. For example, in Jordan, medicinal and herbal plants, and their extracts for domestic use, have been estimated at \$4 million a year. As for the MAGHREB, the MASHREQ is a net importer of wood. Table 4 below presents import and export estimates made in 1996.

Table 4: Exports and Imports of forest products in selected MASHREQ countries

Country	Forest products	Forest products
	US\$ '000 Exports	US\$ '000 Imports
Egypt	9,482	738,575
Iran	950	273,335
Jordan	8,127	181,217
Lebanon	9,269	150,232
Syria	52	74,196
Yemen	245	46,009

Source: FAOSAT Database, 1996

Livestock production. As in the case of the MAGHREB, livestock production in the MASHREQ is an important part of the forestry production system. Livestock provides a major source of income in the drier areas where agricultural production is limited, and a supplementary source of income in areas where rainfall is better but erratic. Livestock population numbers are high and the domestic production of feed is limited. For example, in Iran, livestock population is estimated at three times the feed production capacity of the rangelands. The result is that the traditionally organized forest grazing, with low livestock numbers on agreed rotations, is now breaking down as the pressure on the forests has significantly increased.

Table 5 presents livestock numbers, goats and sheep, in the MASHREQ with estimates of milk and meat production. Goats and sheep are among the most favored type of livestock.

Table 5. Statistics on key livestock in the MASHREQ region, including their meat and milk production

Country	Egypt	Iran	Jordan	Lebanon	Syria	Yemen
Goats (mil. heads)	3.2	27.0	0.6	0.5	1.1	3.9
Goat meat (metric tons)	56.5	109.0	2.5	7.7	4.9	20.6
Goat milk (metric tons)	15.0	398.0	24.0	38.0	79.8	15.7
Sheep (mil. heads)	4.3	53.0	2.0	0.3	14.0	4.3
Sheep meat (metric tons)	1,198.5	1,508.0	110.9	96.4	258.1	144.7

Source: World Bank Report: Rangelands Development in Arid and semi-Arid Areas Strategies and Policies (1995).

Estimates made in 1995 show that the contribution to GDP from livestock in Iran was 30 percent, and no figures were available on the contribution to GDP from livestock in the other countries. However, the livestock production index 1979-81 and 1994-96 presented below shows the significant increases in livestock production in these countries.

Table 6. Livestock production index in the MASHREQ region for the periods 1979-1981 and 1994-1996

Country	Livestock production index	
	1989-91 = 100	
	1979-81	1994-96
Egypt	68	116
Iran	68	130
Jordan	51	162
Lebanon	88	128
Syria	73	103
Yemen	69	118

Source: World Bank Report : Rangelands Development in Arid and semi-Arid Areas Strategies and Policies (1995).

Rural employment and recreation services. Forests are not a large generator of rural employment *per se*, but as was indicated under the discussion for the MAGREB, their contribution to GDP is significant through their protection of agricultural lands and provision of services. The forests also have an important recreational function, particularly in those countries where they are part of national parks such as in Lebanon.

Institution and policies. In all MASHREQ countries, forests are state owned. In Jordan, Lebanon, Syria and Yemen, forests are under the Ministry of Agriculture and forest development is carried out by Directorates under these Ministries. In Iran, forestry is under the Ministry of Environment (“Jehad-e-Sazandegi”). In most cases the Ministry of Agriculture is also responsible for natural resource management and rural development activities and watershed management. These institutions are generally weak and inadequately staffed to carry out their mandated activities. Training of forestry staff is limited, which in turn hinders implementation, monitoring and evaluation of the selected activities. Furthermore, implementing institutions are generally inadequately staffed or trained to deal with participation issues which are key in forestry/natural resource management. Although the importance of the participatory aspects have now been recognized, the process itself is still to be fully adopted, developed and institutionalized.

A whole range of research activities are implemented, including themes on forest conservation, such as desertification, land rehabilitation, sand-dune stabilization, etc. Topics researched are not always determined by the type and severity of the problem. This issue is compounded by weak links between the research agencies and the implementing agencies which make information sharing difficult. These weak linkages mean that the topics selected are not always considered to be of the same priority by both agencies and the results are therefore not fully applied. Funding for research is also generally limited. As is the case in the MAGHREB, several improved technologies have been used (eg. tree planting using vegetative techniques, contouring, terracing etc) with varying adoption rates and mixed success. Part of the failure has resulted from inadequate assessments of additional human and financial resources needed to adopt these technologies.

Private sector participation in forestry activities is limited. Reasons are varied but it is likely that they are unable to compete with Government agencies who are heavily subsidized. Involvement of the private sector should in the long-term, include forest activities implemented on private owned lands presuming land reforms and appropriate incentives are put in place. This involvement will become more important as the areas under public sector management are gradually treated through ongoing programs leaving the bulk of untreated land under threat of degradation, in private hands.

FORESTRY POLICY ISSUES IN MENA

Policies and governance

Forestry policies implemented in the MENA region generally lack adequate incentives to foster collaborative and participatory approaches to forest land management and to include broader stakeholder groups in resource creation and management. In some countries of the region, trees planted and forest managed on communal and/or private lands are under the protection of the Government and cannot be harvested without Government approval. This has significantly reduced interest in tree planting, even in areas where this would be the only viable alternative. These policies will need to be reviewed to renew interest in forest operations.

Illegal harvesting is mostly for individual consumption (mainly firewood, building materials, non-wood products) as opposed to commercial purposes. As such, these issues can more easily be handled through the inclusion of local participation in forest management.

Despite the limited forest resources in MENA, the issues facing forests and people are broadly similar to those encountered in other regions of the world. The main issues are presented in Box 1 below.

Box 1: Key forest issues in MENA

Environmental degradation of forest areas. Overgrazing and centuries of over-exploitation and clearing activities have created inter-linked problems, notably soil erosion, watershed destabilization and micro-climate changes. There is a permanent threat in most of the countries to sustainable soil and water resource management for agriculture due to environmental degradation of watersheds.

Declining quantity and quality of forests. This is because wood and fuel are often being harvested at rates faster than the forests can regenerate. This problem is compounded by inadequate management and fire control of the remaining natural forests and centuries of forest conversion to other land-uses, which has adversely affected both quality and quantity.

Loss of biodiversity. Remaining natural forests in the MENA region contain unique biodiversity, with an important number of endemic species. Reduction in ecosystems types, species loss and loss of genetic diversity is, in some of the countries, of particular global concern.

A favorable trend towards comprehensive development planning is under way in the region, and the role of the forestry sector within the overall economic and social development framework is being recognized in national development plans. Many countries have formulated forestry policies, stressing negative effects of deforestation and land degradation, promoting participatory approaches, conserving remaining natural forests and recognizing environmental roles and the function of forests. However, there is still a reluctance to fully implement collaborative and participatory approaches to forest land management. Moreover, there is inadequate incentive creation to include broader stakeholder groups in resource exploitation and management.

Institutional and legal framework

None of the countries in the region handle forestry at the ministerial level except Morocco. In a large majority of countries, forestry is treated under a Department housed in the Ministry of Agriculture or of Environment and the ministry personnel provided is not necessarily trained in forestry. Furthermore, forestry administrations in many countries lack staff, financial and operational resources, and forest administrations suffer isolation from political power structures and public relations. Revenues from timber sales and/or other forest products are transferred directly to the treasury, who then re-allocate a budget to the relevant agencies. This re-allocation is rarely decided with consideration to the amount of revenue generated by these agencies.

This budgetary system means that the implementing agencies do not have any incentives to increase quality or quantity in the forest as this would not result in better budget allocations.

Relatively well established forestry research institutions exist only in some countries in the region (Iran, Yemen, Syria, Egypt). Most of the research efforts still concentrate on technical forestry problems and need to adapt to better address environmental and socio-economic issues. Forest operations such as fire and pest management are, like silvicultural practices, generally limited by the scarce budgetary resources.

Overall, the maintenance, operation and all related rights for forests are State controlled, in most cases even mandating that forests established on communal and/or private land cannot be harvested without Government approval. Despite this, legal frameworks in the region vary from very weak/almost non-existent to fairly comprehensive ones incorporating many different aspects. However, these laws are not always easy to implement or operationalize, because changes have been super-imposed over old decrees without taking them into account. Apart from that, making any changes is often a difficult and slow process. Several countries, however (e.g. Lebanon), have updated their forest legislation and regulation.

Maghreb. The General Forest Laws (General Forest Law in Algeria, Dahir in Morocco and Forest Code in Tunisia) provide that forests are in the public domain and vests the Ministry or Forestry Departments with the responsibility of their oversight. The laws allow for traditional usufruct for populations living in and around the forests for grazing and gathering of forestry products for personal use within the limits of available resources, as determined by the Government's implementing agencies. The laws also promote rangeland development and establish rules for environment and wildlife protection. In Morocco, the law allows for revenues derived from a forest to be allocated to the budget of the commune in the territorial jurisdiction where the forest is located. In turn, the commune is required to apply at least 20 percent of these revenues to investments in the forestry sector. Unfortunately this money is sent directly to the communes without deducting for the maintenance costs and regeneration of forest resources which is still paid for by the Government budget.

Mashreq. The regulatory frameworks in most of the countries still needs major re-adjustments to make them implementable. In many cases, laws pertaining to forest development are obsolete and subsequent updates have not adequately taken into consideration the old laws making them very difficult to implement. The frameworks generally lack long-term sectoral objectives and this, coupled with the conventional five-year planning for forestry activities limits their outlook.

Sustainable livelihood

The region has a large rural population, over 100 people per sq. km in the most sparsely populated areas. These populations, residing in and around forest lands are generally among the poorest in these countries, suffer from high unemployment, and have limited sources for income generation, and the livestock they keep exacerbates the degradation problem. Although forests do not provide employment for large numbers over sustained long periods, they do provide seasonal employment, and numerous products, including non-timber products. The increasing populations mean that overall, a significant part of the populations will continue to live in poverty. However, the strong link between poverty and forestry/natural resource management also lends a high potential for the reduction of poverty with improved management techniques. Some countries such as Tunisia and Algeria are trying to tackle the poverty issue by increasing the employment creation of forests through the inclusion of local community participation in reforestation, conservation and other rehabilitation activities currently being undertaken.

SUSTAINABILITY OF FORESTS AND FOREST LAND USE

Natural forests

According to forest inventories, most of the remaining natural forests are under-stocked and growth rates are modest. Reestablishment of once degraded or deforested forest lands would take an extremely long time and in many cases is not even possible. The primary functions of natural forests are protective and environmental. The sustainability of forest resources at the present rate of extraction, in particular for firewood, conversion to agricultural land, overgrazing by large numbers of livestock and subsequent lack of forest regeneration, is highly unlikely. In addition, the dry climate of the region makes the forests very vulnerable to fires and forest fires are indeed often devastating in scale. The region has responded to this problem by including in its forestry policies multipurpose forest management, but the implementation of these policies has proved challenging. In addition, the policies will have to encompass both rehabilitation and conservation as opposed to just rehabilitation of degraded areas. Issues related to local participation, a key factor in sustainable resource management have proved challenging as it has not only required that the methodology be institutionalized but also that the Government entities significantly change their day-to-day rules of work.

In many cases, deforested lands are used for agricultural purposes, which for the first few years, when the soils are still fairly fertile, produce reasonable returns quickly. However, because the technical packages adopted and land preparation are often poor, the land quickly deteriorates and production levels fall such that it is no longer worthwhile for farmers to continue with the work. The land is subsequently left fallow with no specific management applied leading to its eventual degradation.

To achieve improved forest land management, other sectors will likely also have to be involved, in particular agriculture and water. Agriculture has an impact on forestry through: (i) subsidies for varying agricultural inputs which encourage the conversion of forest lands to agriculture, even in areas where outputs are relatively low. This situation is aggravated by the inappropriate use of technical packages that would otherwise increase production; (ii) policies, such as support for livestock and cereal production which adversely affect forestry by encouraging land conversion and over-grazing of available resources; and (iii) large livestock populations in the production systems. As feed from agriculture does not suffice for the whole year, livestock are significantly dependent on forests, particularly in the summer months. To harmonize agriculture and forestry, intensified agricultural practices have to be developed, agro-silvo-pastoral systems introduced, including multipurpose tree management, in particular for non-wood forest products and an overall landscape level concept for watershed management implemented.

Because water scarcity is the other major factor limiting the quality and quantity of forests, the water sector needs to be involved in forestry/natural resource management development. With the MENA region being dry, a large proportion of water is allocated for drinking, with agriculture being the next most important user. The scarcity of rainfall often means that the availability of irrigation water is not assured and forest lands that are converted to agriculture are left fallow or abandoned for long periods. For this reason, recycled waste or sea water may play an important role in forest expansion into areas that are otherwise presently hostile, as is being done in Egypt.

Forest plantations

Afforestation and reforestation have been among the main programs of the forestry departments in many countries (e.g. Syria, Jordan, Egypt, Iran, Tunisia and Morocco) and most of the plantations are intended to have protective and environmental roles rather than for productive purposes. Multipurpose trees have been utilized, but in many countries there is still a bias to "popular" species like pines and eucalypts. However, the quality of plantations has varied due to site specific reasons and/or inadequate silvicultural practices. Survival rates are generally high, but growth rates and quality tend to be below expectations, a result of the harsh

climatic conditions. Plantations in the northern countries, in particular Algeria, Morocco and Tunisia, still have a reasonable return on the investments and they continue to be established on relatively large scales. In some countries, like in Egypt where the quality of plantations is generally low, they are established as a means of increasing tree cover and environmental protection. In addition, Tunisia and Morocco have also started the establishment of silvo-pastoral plantations, primarily for forage production. It has also been the experience that reforestation activities on degraded land have sometimes caused serious conflicts with local people who previously used such areas as free grazing land.

The non-wood aspect of forestry (cork, fodder, game, honey, gum, fruits, mushroom, dyes, medicinal and aromatic plants) is also gaining momentum in some of the countries, for example, in Tunisia, where pine cones are collected and sold commercially. However, non-wood forest products are not promoted sufficiently, in spite of the large potential that they could offer from an economic and ecological viewpoint. Examples of potential development for the MENA regions include fruit trees, nuts (walnut, pistachio, almond, etc.), olive tree culture, cork oak and shrub for firewood production and the introduction of suitable silvo-pastoral systems, considering that meat is one of the most important food products in the region. The multipurpose use of plantations is being developed in response to local populations living in and around the forests and also as a means to alleviate pressure on natural forests that need to be rehabilitated.

CIVIL SOCIETY, PRIVATE SECTOR INVOLVEMENT IN FORESTRY

Governments have begun to make strides in involving local community participation in forest development and management. The adoption, development and streamlining of the participatory approach into the planning, design, implementation and monitoring of projects has, however, been slow and relatively painful. The main reason is because the responsible institutions, besides not having adequate capacity to carry out this work, have been skeptical about involving local communities in "their work". On the other hand, local communities have themselves been suspicious of the Government's motives for wanting to involve them. The added expense, and slower implementation of projects, was in many cases unexpected and caused the approach to be viewed as a hindrance.

NGO participation in the region is relatively weak. A majority of the local NGO lack capacity, are underfunded, and are overly reliant on Government grants. The limited resources, capacity and lack of experience in forestry activities greatly reduces their influence in the sector. In addition, private sector participation is limited for most of the forest operations, except for harvesting and processing. There are some exceptions: (i) Algeria - where small enterprises bid competitively for reforestation work¹¹; and (ii) Morocco - where a company was recently awarded a contract to carry out reforestation work¹². To encourage private participation, policy changes would have to be made, including the provision of incentives to enable the private sector to invest in the sector.

Besides policy changes and creating incentives to attract more involvement in the industry, governments may have to engage potential enterprises in capacity building. Presently, even in the harvesting and processing industries where some private participation is present, the personnel lack training and the machinery in use is outdated and results in huge losses and poor quality products.

¹¹ This is taking place in a Bank-assisted project. Participation of these enterprises is also governed by their ability to provide forestry seedlings, which is usually difficult as most forest nurseries are Government owned.

¹² World Bank Report : Morocco Second Forestry Development Project Implementation Completion Report (1999).

ECONOMIC VALUATION AND ECONOMIC INSTRUMENTS

Based on “direct use” (eg., timber and pulp production), the investments in forestry for the MENA region often outweigh the revenues. However, the indirect value of forest lands is high, when the economic benefits from pastures, soil conservation, natural resource management, watershed protection, non-wood forest uses, and biodiversity conservation are taken into account. Furthermore, the recreational functions of forest areas are gaining in importance in all countries of the region. To meet the growing demands from urban populations, shade trees, green belts, forest parks, etc. have been established in some countries during recent years. The lack of estimates, and the long-term nature of these benefits, make it difficult to justify sufficient budget for forestry development with decision makers. There is a need to obtain better quantified information, which could come from more effective and comprehensive approaches to valuing forests.

Economic instruments, including tax policies, refer to a variety of generally market-based policy tools that provide financial incentives or disincentives to forest land users, and others, whose decisions affect the condition and use of forests. Public expenditures on fire and pest management are generally justified, as are financial incentives for watershed management. There is, however, a need to re-define economic instruments for evaluating forestry development, including resource creation to encourage private and community participation. These instruments must take into account: (i) the long growth periods of forests; (ii) the low direct economic returns from most forest activities in this region; (iii) the limited capacity of forests to create long-term employment opportunities; and (iv) the potentially large environmental benefits from forestry. The incentives will need to be supported by relevant policy and legal changes. Examples of where private participation could be fostered is in key activities such as the preparation of management plans, demarcation of forests, and improved utilization of forests and forest soils.

Economic instruments developed should not be specific to the forestry/natural resources sector only, but should encompass all sectors that exert large influences on them, such as the agriculture and water sectors. Another important factor to consider, when developing economic instruments will be alternative funding sources for some forestry operations, in particular those that do not produce direct revenues or are linked to capacity building. Forestry operations such as fire and pest control, or biodiversity control, could benefit from grant funding to supplement the low budget allocations. Grants could also be key in funding research, particularly in topics on forest and forest land valuation, silvicultural development, on broader natural resource management approaches, forest products and marketing, etc. Economic incentives will also need to be developed for implementing Government agencies to encourage them to perform better.

FOREST PRODUCT MARKETS AND TRENDS

All nine countries reviewed are largely or at best completely dependent on imports to meet their needs for wood and non-wood products. The extent and capacity of forest industries in the region depend on the existence of forest resources, and consequently the forest industry is a significant sector only in a limited number of countries, in particular Iran. In other countries, forest industry is confined to small-scale sawmills and panelboard factories.

Certain forest products have played a more important role such as fuelwood as an energy source. Use of certain non-wood forest products, in particular cork, but also nuts (pistachio, walnut in particular), fruits (including olives) and seeds, have also been significant and offer interesting future prospects. The three MAGHREB countries are important producers of cork, a forest product with high development potential in the near future.

Fuelwood consumption correlates directly with population development and poverty, the amount of forested areas and the role of substituting energy sources. Among MENA countries, Egypt, Tunisia and Algeria have the highest consumption levels. These countries will probably also experience the highest increase of fuelwood

consumption by 2010 within the region. The two other major consumers of fuelwood in the region are Iran and Morocco. Egypt is estimated to remain dependent on imports of fuelwood during the coming years.

Consumption trends of industrial roundwood vary greatly in the region. In MAGHREB countries, consumption is estimated to grow in the cases of Tunisia and Algeria whereas in Morocco, a decline is predicted. Iran is by far the biggest consumer of industrial roundwood but the international forecasts vary depending on the overall role of the country in international trade and trade policies. Consumption is also estimated to increase in Egypt, Jordan and Lebanon.

Egypt is the third largest consumer of sawnwood in Africa and it imports almost all of it. The trend is likely to continue. MAGHREB countries face the same prospects of being almost fully dependent on imports. The most significant growth will most likely be in Tunisia, yet Morocco has the largest import market.

Timber prices are generally Government controlled, with little influence coming from the market, although private enterprises are in many cases involved in buying timber. Local timber is not popular with local sawn-timber companies who often find its quality to be below that of imported timber. A significant amount of this timber could probably attain these standards but the poor silvicultural treatments and poor harvesting techniques used would need to be improved first. The limited research into aspects of timber quality has also hindered improvement.

Wood pulp is among the major forest products in all countries of the region. Consumption is highest in Iran. Wood pulp, consumed and imported, is manufactured using chemical processes rather than mechanical. The situation between pulp grades may be changing as Egypt, Algeria and Tunisia are going to increase their own production and consumption of pulp made from alternative sources of fiber, rather than strictly from wood fiber.

Egypt, Morocco, Tunisia and Algeria are among the few countries with a remarkable consumption of waste paper. The same applies to Iran whereas in other MENA countries, waste paper consumption is predicted to remain low during the next decade.

GLOBAL ISSUES: BIODIVERSITY CONSERVATION AND CARBON SEQUESTRATION

Biodiversity conservation

Conservation of biodiversity and the genetic diversity of forests trees, wild fruit-trees, fodder, medicinal and aromatic plant species and wildlife, is among the important functions of the remaining natural forests in the region. The growing attention of wild fauna and flora is closely related to a growing emphasis on ecotourism. The MENA region possesses some very important global biodiversity. For example, Morocco is the second most important in terms of biodiversity in the Mediterranean region after Turkey¹³. A significant amount of this biodiversity is found in forests. Where management plans exist and are under implementation, biodiversity has benefited. However, protected areas networks are still under construction, and not all key biodiversity has been protected or represented within the networks. Unprotected biodiversity is threatened by human behavior, and in many cases, runs the risk of being completely lost. The development of participatory approaches to biodiversity conservation and management is a major challenge in the region but efforts have begun as is the case for the Morocco Protected Areas Management Project and the Tunisia Protected Areas Management Projects, both GEF-supported.

¹³ Plan Directeur des Aires Protégées (1996)

Carbon storage

The ecological, economic and social potential of different activities aimed at counteracting global warming (carbon sequestration¹⁴, carbon avoidance and/or carbon substitution¹⁵) has not been estimated in the region. Based on the fact that this value is dependent on biomass and available technology, the value of these forests services and stock stored in the trees are not of significant order. However regionally, the carbon sequestration values could be high, further research on this topic is needed.

LESSONS LEARNED AND REMEDIES TAKEN

Lessons learnt from previous operations has facilitated the identification and preparation of forestry projects as the key issues become better understood. However, the development of an appropriate design to implement these projects has remained challenging. The complexity and interaction of a multitude of issues, of which many are cross-sectoral, has blurred the lines of what should be considered priority and how best to address these issues. Moreover, because many of the partner institutions in implementing countries have limited capacity and finances these issues have remained difficult to resolve. In addition, policy and legal changes generally take long periods of time such that by the time they are effected, the projects are either almost or are complete and are therefore rarely put into operation. Furthermore, the nature of interventions in the form of projects, and the short-term implementation periods of these projects have meant that policy and legal framework changes are sought at project level rather than the sector level. Therefore, the overall policy gain is diluted and the next generation of projects must seek additional changes in order to tackle similar problems. Capacity building of personnel, although it is often included as an integral part of project design, it is rarely fully carried out because Governments do not want to borrow for staff training as they consider it expensive and prefer to have it financed through grants.

Another major issue has been local community involvement in forestry development and management. This has required a very painful and slow evolution in mentality in both the populations and respective agencies. Lessons from projects that have included participation have shown that sustainable maintenance of investments require local participation at all stages: from project preparation to evaluation. The level of ownership, and hence sustainability of investments made is dependent on the stage and degree to which the populations are integrated in the project. In addition, priority setting must be done by all concerned partners at all levels: national, implementing agency and stakeholders. Overall, private participation remains in an embryonic stage and continues to be difficult to stimulate. Varying efforts to include private participation have not been altogether successful. Although some changes are now taking place, private enterprises are still rarely viewed as possible partners and they remain marginalized in many cases, restricted to the buying of timber for re-sale to processing companies or participating through Bank-financed projects.

The low budget allocations in forestry have not only limited investments in the sector but they have also constrained the size and type of projects implemented. The budgetary problems, coupled with the need to integrate forestry into the wider natural resources development agenda, has led to the decline in "stand-alone" forestry projects and an increase in the integrated projects having forestry as one of the subject matters to be

¹⁴ Carbon sequestration is the absorption of atmospheric carbon into tree biomass and hence incremental addition to a carbon stock. The sequestration rates will differ by species, as will the carbon flux, which represents the flow over time from one carbon stock to another, such as fossil fuel combustion releasing carbon to the atmospheric stock, or plant photosynthetic growth absorbing atmospheric carbon into the terrestrial stock. Stock, the carbon reserved, should not be confused with sequestration, the fixing of the carbon.

Carbon avoidance relates to the maintenance of carbon stocks present in the forest. Actions like prevent fire or support RIL could be defined as carbon avoidance project. Carbon substitution relates to the use of wood as substitute for more energy intensive materials, like steel, cement, etc.

treated. These integrated projects have been better received and have gained wider acceptance. Moreover, they address regional problems in an integrated manner. Overall, the main lesson has been that forest resource management requires an integrated approach, taking into account the priorities of the local communities, private sector and governments. In this respect, in order to encourage participation by all concerned stakeholders, any planned forest operations should contain explicit incentives directed toward each concerned interest. A brief description of more specific lessons is presented below.

Planning

Forestry planning is based on five-year plans, and although these plans are well suited to the budget planning cycles of the Ministries of Finance, they do not fit with the long-term planning required for forestry/natural resource management projects. The Bank recognizes the importance of long-term planning, particularly for sectors such as agriculture and forestry/natural resource management, and it has initiated work on instruments such as the Program Lending and the Comprehensive Development Framework (CDF) which represent timeframes of ten years or more. These instruments would complement the three-year CAS and would include and highlight cross-sectoral issues. In this framework, issues would be tackled in a phased manner allowing policy/legal framework changes to be obtained and implemented. This framework is ideal for the forestry sector where project implementation is slow. The CDF would also allow enough time for adjustments in the outdated policies and legal framework changes to be made and implemented.

Institutional strengthening

The Bank is stressing institutional strengthening of all involved agencies through training, provision of needed technical assistance, restructuring where needed, and provision of goods and services as required. Through these efforts, the Bank has also increased the planning base of the respective agencies. For institutions involved in follow-up projects such as the Forestry Department in Tunisia and the Ministry of Forestry in Morocco, the results of this effort are apparent.

Implementation

The Bank is making efforts to forge partnerships with local NGO to assist in project implementation. However, these partnerships require that the Bank helps them build adequate capacity to increase their implementation effectiveness.

Monitoring and evaluation

The Bank has been putting emphasis on developing simple but comprehensive monitoring and evaluation systems within the agencies. Although investing in techniques such as Geographic Information Systems (GIS) and Management Information Systems (MIS) has significantly enhanced the M&E systems, measuring the impact of investments remains, in the short-term, challenging because of the long-term nature of forest growth vs. short project implementing periods. More will need to be done to enable agencies to follow-up on investments over the long run and assess the respective impacts.

Woodland management programs, and the promotion of alternative fuels for firewood, are also being promoted to reduce dependence on forests as the primary provider of cooking and heating fuel. The degree of success has been varied and largely dependant on the accessibility and cost of the alternatives.

There are also significant lessons that illustrate the importance of developing integrated watershed management projects as an instrument to poverty reduction. Examples of such projects are the Lakhdar project

in Morocco, the Matrouh project in Egypt and a project in the Atlas Hills of Tunisia which is illustrated in Box 2 below.

Box 2. Participatory watershed management and poverty reduction

A pilot project undertaken over an area of 70 000 ha in the Atlas Hills of Tunisia has demonstrated the feasibility of combining improved watershed management with improved income opportunities for participants. The area is dominated by smallholders with fragmented holdings on slope land with extensive erosion, and has many landless families. Average family incomes are estimated at US\$110 per month, of which seasonal migration and other off-farm labor account for about half. Degradation of vegetative cover and soil erosion is extensive in the zone, and conflicts over resource access were increasing, while technologies offered by public extension services were often inappropriate.

Project activities included forestry, agro-forestry, tree platforms (micro-terraces), small-scale earth bunds, small checkdams consolidated with fodder species, hill reservoirs and small irrigation schemes. Consultative processes aimed at resolving conflicts between farmers and the Government over access to, and use of, national forest areas resulted in changes in tree species used, the opening of access paths, and the contracting of local labor for many forest activities. Large water retention schemes, which mostly benefited downstream landowners, were replaced with farmer-selected technology options implementable on individual farms. Support was provided for tree crop establishment (olive, almond, and fruit trees) combined with contoured intercropping of legumes. The process of changing farmer organization into user and special-interest groups, and the strengthening of locally active NGO, have been critical to the success of the whole program.

As the project is still underway, sustainability cannot be readily assessed, but an estimated 75 percent of the families have participated in one or more activities, while Government support systems have been restructured to provide options based on appropriate technologies and cost sharing with farmers. The combination of participatory approaches, conservation measures and income creation will offer considerable potential for development elsewhere in the region.

Source: FAO Farming Systems and Poverty (2001).

The Bank has also been involved in resolving problems affecting forestry management, such as those related to the degradation of rangelands by livestock over grazing. For example, in Morocco, Tunisia and Yemen, the Bank has been involved in assisting respective governments in developing rangeland strategies and policies emphasizing participation, which has been one of the primary causes of failure in earlier projects. The Bank is also encouraging the reduction in numbers of livestock head through the introduction of improved genetic or better suited species. An example of the type of work that could result from integrating pasture and range rehabilitation is from Syria. This is presented in Box 3 below.

Box 3. Range Rehabilitation in Pastoral Farming Systems

The Al Badia steppe area of Syria receives less than 200 mm per annum of rainfall and has been subject to widespread deterioration of the rangelands and loss of wildlife habitats (and consequently of wildlife). An FAO project has been active in the area since 1996, covering 108 000 ha of rangeland and 22 000 ha of wildlife reserve. Its main focus has been on reversing the degradation of the rangelands, rehabilitating areas with the participation of the local Bedouin population and re-introducing oryx (*Oryx leucoryx*) and sand gazelle (*Gazella subgutturosa marica*) to the Talila wildlife reserve. In addition to the rehabilitation of nearly 10 000 ha using seed of native species (*Salsola vermiculata* and *Atriplex leucoclada*) and innovative and cost-effective direct seeding technologies, the project has: initiated grazing management strategies; introduced an environmental monitoring system; collected data on livestock production; identified and implemented options for income generation and employment for local community members, particularly women; improved the technical skills and capacities of national project staff, training technicians, extension officers and Bedouin promoters; and sensitized the Bedouin community.

Major impacts and lessons learned include the feasibility of range rehabilitation by reseeding native species, the importance of community participation, project implementation flexibility, longer-term assistance for sustainability, the need for both local and national drought strategies and the need to focus on land tenure issues.

Source: FAO Farming Systems and Poverty (2001).

BANK'S COMPARATIVE ADVANTAGE

Having examined key issues in the region, the Bank's performance, the lessons learned and actions taken the next logical step is to discuss where the Bank's comparative advantage, as a partner in forestry development in the region, lies. This issue is becoming increasingly important as the Bank is no longer the only development agency involved in this sector.

To discuss the issue of comparative advantage, it is necessary to split the forestry issues into two main categories: (i) those that are technical in nature and hence require the development of technological solutions; and (ii) those that need policy, institutional and legal framework changes, including those linked to research. Community participation is assumed to contribute to solutions for either group.

Technical

Because of its limited human and financial resources to provide the client with continued technical advice necessary to build capacity within generally weak partner institutions, the Bank does not compete as well as agencies possessing a significant number of personnel who are employed to work full-time on forestry issues, and who, in addition, may have personnel posted in the specific client countries. The Bank's two or three supervision missions a year greatly restrict interaction and learning by doing, as opposed to what can be offered by agencies such as the FAO and GTZ which tend to be based not only in the country, but are represented at the regional level too. However, the Bank does have the capacity to support NGO and other grassroots agencies that benefit, not only from capacity building but also from the Bank's vast international experience. The Bank also has the convening power among the different agencies involved in forestry development through its numerous contacts and partnerships, such as that with WWF.

The Bank is also well placed to support research efforts in the client countries through the provision of resources, such as technical assistance contracted from the best institutes, support of specific research topics that are deemed important, or leverage to attract both the finances and the technical assistance from other agencies.

Policy and legal framework

The Bank is well placed to influence policy/legal framework issues in the sector as a whole only if the time frame within which these changes are to be made is long enough and the process is not simply project driven. Experience has shown that changes that are project driven are short-term, too specific and often do not tackle the roots of the problem. The Bank's new Program Lending and Comprehensive Development Framework approaches, where lending is based on an agreed program, as opposed to a project, have implicit advantages for forestry development. With this longer vision, policy and legal changes can be phased into the program's implementation.

Among its strongest comparative advantage, the Bank is well placed to deal with issues related to institutional development because of its past experience, access to institutional development specialists, ability to attract other key donors and provide financing as part of a lending project or program. This type of support has long been recognized by the Bank's clients and other donors and is often specifically requested. The Bank's involvement in many different sectors in any given country also puts it in a position to deal with cross-sectoral issues such as policy and legal framework changes that are more broad-based and less sector specific.

ASSISTANCE STRATEGY TO THE FORESTRY SECTOR

Forests in the MENA region cannot be treated as commercial activities but more in terms of environmental/natural resource management. As such, forestry cannot be treated in isolation from natural resource management as a whole. Forests and woodlands are an important landscape element.

The World Bank has defined its overall objective to be poverty alleviation and sustainable development. In order to play a meaningful role in achieving this objective, the forestry and biodiversity assistance program to the region will have to be directed at helping client countries meet objectives in the following areas:

- Policy and institutional reform, to position forests within a wider context of sustainable natural resource management. This objective includes addressing impediments to optimal forest use and conservation.
- Poverty alleviation through collaborative forest land/watershed management and multipurpose resource creation, in particular tree planting to sustain livelihoods.

To meet these objectives, the World Bank has at its disposal a series of predefined instruments comprising (i) Economic and Sector work; (ii) Lending, IBRD/IDA loans, Grant financing through GEF; and (iii) Arrangements of Partnerships and Alliances.

Economic and sector work

Little economic and sector work has been carried out for forestry in the region. It would clearly not be strategically sound to advance “stand alone” forestry projects. Instead, incorporation of forestry into the broad natural resource management development strategy is likely to be more successful, and economic and sector work will need to be carried out to determine how best to : (i) expose client countries to modern techniques and ideas in natural resource management, including forests and forest land management; (ii) assist in setting priorities for the sector’s development; and (iii) direct future Bank support to the sector based on sound knowledge. Possible themes for Economic and Sector Work in the MENA region are presented in Box 4.

Box 4: Possible themes for economic and sector work in the MENA Region

- Linkages between forest land management and broader economic and rural sector reforms;
- Creating an enabling policy environment for collaborative forest management, achieving sustainable natural resource management and reduction of rural poverty.
- Development of suitable economic instruments, valuation of forest services: watershed services and grazing on forest land.

Lending and financing for forestry

Lending will be based on results of ESW and be integrated as part of a longer term comprehensive development framework. The lending program would be influenced by: (i) the willingness of MENA client countries to engage in dialogue and borrow mainly IBRD funds for activities in forest management which may have only long term benefits; and (ii) by competing claims for resources both within the client countries and the Bank. Lending for forests and forest land use issues will have to be combined with grant allocations through bilateral donors and the Global Environmental Facility, in order to achieve given objectives. Possible strategic elements for a lending program are presented in Box 5 below.

Box 5: Possible strategic elements for a lending program proposed partially through its partnership with the Program for Forestry (PROFOR¹⁶) in the forest sector in MENA.

- **In the MAGHREB and Iran.** Improving public sector forest management (policy and legislative reform, fire and pest management, research and training, collaborative resource management and public awareness creation for forest and forest land issues, resource rehabilitation and creation, genetic conservation of the remaining natural forest stands).
- **In countries that are extremely resource poor.** Participatory land management and watershed protection, introduction of multipurpose tree species to maintain ground cover while fulfilling other needs with a focus on poverty alleviation, sustainable rural livelihoods and decentralized decision making on forest land use issues.
- **Valuation of forest and forest land.** Focus on non-wood forest products and forest land services.
- **Forestry Planning.** Multi-sector based forestry planning on a long-term basis, and not simply based on five-year plans. The longer period allows for : (i) appropriate prioritization of issues; (ii) research to be carried out, disseminated and integrated into project implementation; (iii) policy changes to be made and operationalized. Studies and work carried out by other agencies, such as GEF is important for initiating and developing dialogue with the client countries, and needs to be fostered and encouraged.
- **Financing.** The issue of financing will likely remain a difficult one to solve, but some changes could be made to alleviate the problem through effective partnership arrangements on national and international levels. Most important would be to offer the region "blends" of grant/loans to allow activities such as technical assistance and research, for which the client countries borrow for to be carried out. In the MENA region, where forestry activities are rarely profitable but have a very important conservation role, mobilization of "affordable" money for this sector is their preoccupation.

PROFOR, Program for Forests is a bilateral donor supported forest program aimed at strengthening national capacity to program and implement forestry development activities.

Institutional issues

Strengthening institutional capacity must remain a key objective in future work. Progress in the agencies' capacity to plan, implement and monitor forest activities is evidenced by implementation results of past and present projects. The lessons learnt from MENA and other regions show that this exercise is progressive. Besides, capacity built is not always sustainable, for example, personnel trained do not always stay in the sponsoring agency long enough to disseminate knowledge gained. Another issue is that pertaining to decentralization. The majority of the institutions in the region are centralized with a top-down decision making mechanism, which has largely been proven to be ineffective. Decentralization, as a means to: empower the population; solicit their participation; permit closer interaction between the administration and the populations; and most of all, to ensure sustainability in investments, must be encouraged. In addition, equipment bought and management systems developed are not always upgraded or maintained, risking their sustainability. The Bank will have to, together with the client countries draw-up priorities of institutional issues to be addressed including policy and legal issues, in the short-term and in the long-term.

Appropriate technology development and adoption

Successful forest management requires that the best possible forest technologies are developed, adapted and adopted. These technologies include choice of species needed by farmers, good nursery practices, planting and post-planting tree management. For this, it is important to understand : (i) what determines farmers' choice of technologies; and (ii) additional human and financial resources required to develop, adapt and adopt these technologies. Extension systems need to be developed to strengthen the interaction between farmers and local technicians, and between local technicians and on-station researchers. Technologies once developed should be treated only as a baseline to be updated and improved using lessons learnt through implementation and from similar projects. The Bank has been supporting efforts to increase capacity in research, and although

this has been a slow exercise results have been encouraging. Emphasis must now be put on ensuring that research carried out is consistent with farmer needs and that the results are disseminated and adopted. Technology development must range from good nursery practices, planting and post-planting management. On the whole, quantity must be consistent with quality produced to interest farmers.

Land-use planning

Land-use planning to include forestry development is an issue that will need to be taken into consideration if private farmers are to be interested in tree planting. Incentive creation will have to be accompanied by enabling policies and laws. In many countries, the forest laws restrict free harvesting of forest products once planted because of their contribution to watershed management or barrage siltation preventive measures. Targeted incentives to win the population's consent in these activities should be developed. Most importantly, the blanket restrictions on harvesting forest products must be reviewed. Given the Bank's significant experience, including on Policy issues, it is in a good position to assist policy makers develop appropriate incentives for sustainable land use planning.

Partnership and alliances

Forestry development should be carried out through partnerships with all stakeholders involved from its planning, design, implementation and monitoring stages. Partnerships also need to be fostered with other agencies which are involved in the sector in the different countries. Dialogue with other development partners has generally been limited. The Bank is now working to change this situation but more effort is still needed to reduce duplication and to build complementarity. Partnerships with local NGO also need to be cultivated and must be accompanied by capacity building measures. In addition, where local NGO are concerned, it will be necessary to offer incentives and clear guidelines on how these NGO can interact/coordinate with Government agencies.

The different elements of partnership arrangements include:

- **Stakeholder and community participation.** Participation of all stakeholders will be key to the sustainability of investments made. Although its importance is well understood and accepted, its progress has been slow paced. Work still remains to be done to mainstream it into the planning process and into day-to-day implementation. To allow this to happen will require that policies with adequate incentive systems are put in place. The overall legal/policy/incentive structure would need to be reviewed and appropriate changes made. This review would also include other sectors that have a significant effect on forestry/natural resource development to find ways to minimize this effect.
- **Private participation.** Lessons from previous projects and elsewhere have shown that private participation is important because: (i) it helps to streamline the Government's role to only that which can be realistically tackled; (ii) it acts as an incentive to carry out quality work; (iii) in the case where roles are well defined, the interaction between the private sector and the Government can be beneficiary; and (iv) there are possibilities in attracting some private sector investments in the forestry sector when the incentives are conducive. An example would be that forestry planning remain as the overall responsibility of the Government while forestry operations become the responsibility of the private sector, NGO and local populations. The respective Government would however, maintain its overall coordination and monitoring role as well as core services, such as fire and pest control. It is important to add a word of caution here. It will be very important that role definition, and the incentive structure take into account the fact that forestry operations are long-term, generate limited revenues over the short period, and are not going to be as lucrative in the MENA region as they are in the tropics.

- **Financing.** The issue of financing will likely remain a difficult one to solve, but some changes could be made to alleviate the problem through effective partnership arrangements on national and international levels. Most important would be to offer the region “blends” of grant/loans to allow activities such as technical assistance and research, for which the client countries borrow for to be carried out. In the MENA region, where forestry activities are rarely profitable but have a very important conservation role, mobilization of “affordable” money for this sector is their preoccupation. In response, the Bank would have to, alongside the loans offered, mobilize larger amounts of grants to support this conservation role. To this end, partners working in environment, biodiversity conservation and natural resource management could be persuaded to finance activities that are purely conservation. Again, this could be through agencies such as GEF.

Overall, it is clear that the close linkages between forestry and poverty mean that forestry should be developed to protect the environment, encourage economic development and alleviate poverty and achieve social equality (increased access to forest management and products, increased participation of all stakeholders).

RESULTS OF THE MIDDLE EAST AND NORTH AFRICA CONSULTATION MEETING

A workshop was held in Tunisia between February 23 and 25, 2000 to seek the views of the representatives of the nine MENA countries on Forestry Development in the Region. The workshop was structured into the 5 parts presented below. Results of the MENA Implementation review were a key part of the presentation, and the critical issues identified and the recommendations made to the Bank during the workshop are presented in Annex 3 below.

- **World Bank presentations:** Presentations by World Bank staff provided participants with an overview of the Forest Policy implementation Review and Strategy (FPIRS) process, a review of forest and forest land use issues in World Bank client countries in the MENA region, an overview of some of the principal findings of the Operations Evaluation Department (OED) review of the 1991 Forest Strategy, and an overview of instruments available to the World Bank in support of forest sector activities in client countries.
- **Identification of key issues:** On the basis of these presentations and subsequent discussions which brought out the individual experiences of participants, the meeting brain-stormed both key themes relevant to the development of the forest sector in the MENA region and key issues which needed to be addressed in the context of the main themes. Some seven main themes and some forty issues were identified.
- **Identification of critical issues:** The participants then voted to distinguish the issues which were considered critical from those of lesser importance.
- **Recommendations:** The meeting then broke out into two groups – MAGHREB and MASHREQ – to consider the critical issues and what recommendations should be brought forward for further consideration in the FPIRS process.
- **Validation:** The conclusions of the two groups were then presented to the full meeting and discussed and agreed.

**ANNEX 1: EXAMPLES OF PROJECTS IN FORESTRY AND NATURAL RESOURCE
MANAGEMENT IN THE REGION**

Country	Project Name	Activities	Closing Date
Algeria	Forestry & Watershed	Reforestation, silvicultural treatments and watershed management	12/31/98
Algeria	Rural Employment	Reforestation, soil and water conservation works and fruit tree planting	03/31/03
Algeria	Rural Employment II	Reforestation, soil and water conservation works and fruit tree planting	Under Preparation
Algeria	El-Kala National Park	Biodiversity conservation	
Egypt	Matrouh Resource Management	Natural resource management in dry-land areas	12/31/01
Egypt	Matrouh Resource Management	Natural resource management in dry-land areas	Under Preparation
Morocco	Lakhdar Watershed Management	Land use and natural resource management improvement	12/31/03
Morocco	Protected Areas Management	Forestry, biodiversity and natural resource management	06/30/06
Syria	Biodiversity Conservation	Under preparation	-
Tunisia	Second Forestry Development	Reforestation, silvicultural treatments and natural resource management	12/31/00
Tunisia	Development of Mount NW Region	Natural resource management	06/30/00
Tunisia	Development of NW Mount and Forestry Areas Project	Natural resource management	Under Preparation
Tunisia	Natural Resource Management	Natural resource management	06/30/03
Yemen	Land and Water Conservation	Forest conservation, reforestation, soil and water conservation, and watershed management	05/28/00

Source: Bank Project Documents.

ANNEX 2: THE NINE MENA COUNTRIES

The purpose of this Annex is to present country briefs of each country covered in the region. A number of aspects are reviewed, of which the most important are: (i) background; (ii) forest types and ecosystems; contribution of forestry to the economy; major factors affecting forests; focus of forestry activities in the region; institutional and regulatory framework; ownership characteristics; poverty and sustainability; value of forests; and sustainability issues.

ALGERIA

Background

The Algerian forestry sector has suffered significantly due to the civil unrest in the country. The security situation has significantly limited forestry operations in the country, as well as external technical assistance to the sector, including Bank operations which are no longer supervised from the field, and are now conducted in Algiers or from headquarters. The lack of knowledge flow has contributed to weakening the institutional capacity. Algeria, after Sudan, is the second largest country in Africa and in the Arab-Moslem world. It covers approximately 2.4 million km², of which approximately 2 million km² are desert with an extremely harsh hyper-arid climate. Forests cover approximately 3.7 million ha or 1.5 percent of the land area. Of this 1.5 percent, half is considered to be relatively high-quality, relatively high value forest and the remainder is lower quality forest or marquis. If the Sahara is excluded, then forest cover can be estimated at 15 percent of northern Algeria, with an additional 15-20 million ha being covered in vegetation suitable for grazing, esparto scrub and shrubs. More than 1 million ha of the remaining wetlands can be considered to be of great ecological value.

Forest types and ecosystems

Rainfall increases from south to north and from west to east. As such, the best growing conditions for trees are found in the north-east of the country, with rainfall above 1200 mm. At these high altitudes, cork, zeen oak and cedar forests are found. However, as is the case in a large part of Algeria, the forests are degraded and regeneration is significantly inhibited by over-grazing. Aleppo pine is the most important wood resource in the country, and it makes up approximately half of the "productive" forest area. This species is relatively hardy, and a larger part of it is found between 600-900 mm of rainfall a year. Aleppo pine is generally intermixed with holm, oak, thuya, and juniper. Eucalyptus has been planted for use as poles, firewood and for small-size timber. Alfa, an important part of the ecosystem, thrives in the saline soils of high plateau steppes of Algeria, serves as an important element of a fragile ecological system, but also has economic value in the production of high quality paper.

Biodiversity

Algeria has placed significant importance to the preservation of its natural resources. It has set aside, four natural reserves, with a total area of 36,800 ha, seven National Parks, covering 37,000 ha, four game reserves, 50,000 ha and two parks in the Sahara covering 560,000 km². Algeria has lost a large part of its wetlands to draining for agriculture, although at least 1 million ha could still be considered to be of international interest. These wetlands house biologically important fauna and flora, and are, in addition, an important refuge for migratory and over-wintering wildfowl. One of the most important wetlands is in the El-Kala national park, which has received funding from GEF.

Contribution to the economy

There are no available figures indicating what the contribution to GDP from forests is, but it is safe to conclude that the most important contribution to date has probably been ecological. It is estimated that Algeria imports over 1.0 million m³ of its wood requirements while producing only 200,000 m³ year of commercial type timber, of which industrial and sawn-timber are estimated at 160,000 m³ and the remaining 40,000 m³ is for pulp and paper and firewood. However, with sustainable harvesting, Algeria could produce over 700 000 m³ a year of commercial timber. Other statistics on production data for Algeria show production estimates in 1998 as follows: Alfa – 8,702 tons; cork oak – 16,202 tons (Algeria is a major cork producer); carbon – 41 tons (1995). Another important contribution from forests has been in the form of grazing, 1.3 million tons of forage (not all from forests) were estimated to have been produced in 1997. Algeria has a large herd of livestock, which was estimated in 1992 to contribute at least 40 percent of the gross value of agricultural production.

Budget allocations

Agriculture receives 10-15 percent of the public capital expenditures (investment), and forestry receives 25-50 percent of this. Despite this seemingly generous amount, problems faced by Algerian forests, rapid deforestation, decreasing productivity of forest rangelands, growing erosion damage, and increasing sedimentation of dams, persist, because in reality the investment slice is still insufficient. The relatively poor returns to past investments, weak implementation capacity, weak organizational arrangements and inadequate definition of priorities, have largely contributed to the reluctance of the Government to increase this funding share. Given the Government's tight budgetary situation, compounded by the drop in oil prices and the security situation in the country, it is unlikely that the allocation can be significantly increased in the near future. However, there is potential for the forests to be more profitable.

Major factors affecting forests

Due to population pressure, more and more marginal land is being brought into cultivation each year. Livestock owners are also grazing their animals on land that, only a few decades ago, was either under forest or had good vegetative cover. Overgrazing plays a key role in the degradation of forests and watershed and to the flora and fauna (and biodiversity degradation in general). Political sensitivity of curtailing grazing rights at the local level, make it difficult to regulate forest ranges. Past Government and other agency initiatives failed dismally in their effort to manage forest degradation by controlling over-grazing, mainly because they lacked a developed participatory approach and was therefore unacceptable to the herders. The increasing rural population and socio-economic lifestyle changes of herders from nomadic to sedentary lifestyles has increased grazing pressure in some of the forests. The use of lorries, combined with the introduction of cell phones is significantly contributing to destruction of formerly protected areas. The result is that over 12 million ha are threatened with erosion, much of which is in the ecologically fragile steppe areas. Approximately 40,000 ha of scarce agricultural land is lost each year because of erosion and desertification. Despite past efforts at abating erosion, it continues almost unabated. The lack of vegetative cover means that rainfall runoff rates are high and this water, instead of charging the aquifer, is wasted. Forest fires, partly due to the civil unrest, have significantly contributed to the loss of forests.

Research

The National Institute for Forest Research (INRF), under the auspices of the Ministry of Agriculture is responsible for forest research. The poor focus and prioritization of research topics has caused slow delivery. Research has also tended to ignore the important linkages between social issues and technical considerations. These problems have been compounded by a shortage in the recurrent budget allocated for research.

Focus of forestry activities in the Region

Although agriculture has been on the Government's agenda as a priority sector for a while now, activities in the forestry sector have been much slower. The first donor funded forestry project in Algeria began in 1992, and with the subsequent unrest in the country the project performed very poorly. However, there have been subsequent activity in the sector, but supported through a project taking conservation in a more broader context, and forestry as a component, but still implemented by the Forestry Department. The results have been significantly better and the Government is expressing interest in carrying out follow-on projects of this nature, which are multi-objective. Other donors active in the sector are IFAD and GTZ.

Institutional framework

The Ministry of Agriculture and Fisheries (MOAF), has the overall responsibility for the development of the forestry sector, including watershed management. The General Directorate of Forestry (DGF), which recently adopted a decentralized structure, is responsible for the administration and management of the forestry sector and the execution of Government forest policies, planning and promotion of productive activities, forest protection, and soil conservation.

Regulatory framework

The General Forest Law (Law 84-12) governs Algerian forests, together with related implementing decrees and orders. Under this law, all existing forests, and other woody vegetation, as well as forestable areas, state or collective, belong to the national forest estate and are governed by the General Forest Law. Forests are classified under three broad categories: productive forests, protective forests and special interest forests (parks, reserves, and forests of military or scientific interest). The environment and nature conservation is governed by a General Law on the Protection of the Environment (Law 83-03) of February 1983. Algeria has also ratified several major international conventions on flora and fauna protection, as well as on air and sea pollution.

Ownership characteristics

Unlike in Tunisia, land owners can plant trees on their private land without any consequences, and private exploitation of some products, such as Alfa is allowed.

Poverty and sustainability

Within the 5.5 million ha of priority catchment areas, approximately 320,000 families depend, to a varying extent, on agriculture for their living. A decrease in the resource base, particularly in the mountainous areas means that any decline in the agricultural resource base will have significant social and economic impact, in terms of migration to towns, increased urban unemployment and an escalating demand for essential resources and services.

Implementation of forestry operations

The General Directorate of Forestry (DGF) is the main implementing unit for forest activities. Private participation is still limited to implementation of certain Bank operated projects mainly. The use of small enterprises has recently been tried and the results have been positive, although limited, by the fact that private individuals cannot, as required in most bidding documents, supply forest tree seedlings. Private nurseries favor fruit trees and other seedlings that have a steady market than forest trees which do not have a guaranteed market. Also, the implementation of forest activities has generally lacked other activities such as, soil conservation, crop, livestock and water development to encourage an integrated solution to the problems, and this will need to be developed.

Participation

As it is virtually impossible to participate in field supervisions, it is difficult to give an objective judgment, and in the final analysis the judgment here will be from information supplied by field consultants. It is however, becoming clear to the forest administration that, given the past experience with other initiatives and projects that failed due to the lack of participation, regulation through enforcement is unlikely to be effective in the long run and participation will have to be considered as the only feasible way to control further deforestation and degradation. Historically, participation by local populations has tended to be in the form of paid labor, to carry out activities that could not be mechanized. As a result, local populations do not feel ownership towards any investments made for this work. This is evidenced by the relatively low sustainability of many of the investments made which are generally viewed as Government activities. Participation in private reforestation programs has also come unstuck because of the stipulation in the Forest Code that all existing forests, and other woody vegetation, as well as forestable areas, state or collective, belong to the national forest estate and are governed by the General Forest Law.

Value of the forests

Local industry is generally not interested in the local wood because of its low quality, generally as function of the poor sylvicultural techniques and harvesting techniques employed. Over 90 percent of the wood used is imported. On average, domestic production is used for 50 percent panel wood, 25 percent timber, 20 percent fuelwood and 5 percent miscellaneous uses. However, it is without doubt that the largest contribution of the forests are its contribution to the ecology. Although the majority of the forest wood is not in itself very valuable, two forest products are important sources of foreign exchange. Of the total forest production for Alfa, cork oak and carbon, key production outputs besides sawn-timber and pulp-wood, cork oak accounts for 65 percent and Alfa for 35 percent of this production. Both the cork-oak and the Alfa (used for paper making) are of very high qualities.

Sustainability

Only 18 percent of wood that could be exploited on a sustainable basis is harvested. Based on the forest resources present in the country, it can be estimated that if at least 50 percent of the Aleppo pine, cork and zeen oaks, and cedar, and 100 percent of the fast-growing species can be exploited commercially, then Algeria could produce over 700,000 m³ of wood annually on a sustainable basis – at least 3 times the present harvests.

Economic

The economic incentives on livestock production, that is, the high prices of meat, low barley prices and “free” pastures have encouraged increases in livestock herd. In addition, the largely poor populations keep large herds as an added source of revenue, though for many in the dry areas, it is a primary source of income.

MOROCCO

Background

Moroccan forests occupy approximately 5.8 million ha (8 percent) of the country's total land area. These forests are mainly concentrated in the north-western part of the country where the climate is cooler and more humid. In these areas the forests cover at least 20-30 percent of the land area. Planted forests (at least half are eucalyptus and other hardwoods, and the remaining representing coniferous species, mainly pines and cypress), represent about 1 percent of the total land area and the esparto grass in the east represents 4.5 percent of the total land area and another 1 percent of acacia in the pre-Saharan shrubs in the south.

Forest types and ecosystems

In the moist north, the main indigenous forest tree species are holm oak (growing at altitudes up to 1000 – 2000m), thuya, cork oak, cedar (to altitudes of 1400-2200m) and pines and junipers, and in the south, argan. Morocco, after Turkey, is the second most biologically diverse country in the Mediterranean basin, outpaced in species and habitat diversity only by Turkey. There are an estimated 4,000 species of vascular plants and over 40 percent are endemic. Despite this, less than 1 percent of Morocco's surface currently has some form of active protection status. Morocco has designated a number of national parks, which have however, remained non-operational for a variety of reasons. The Protected Areas Management Project (GEF funded), under preparation is being prepared to address this issue. These national parks have in them some very important natural forests which have suffered, and continue to suffer extensive degradation.

In recent years, awareness of linkages between development activities and biodiversity degradation has grown in Morocco, supported by a number of participatory assessments and studies undertaken during formulation of the National Environmental Action Plan. A legal framework to carry out systematic environmental impact assessments is being developed. A comprehensive study of Morocco's biodiversity and protected areas was completed in 1996 with the support of the African Development Bank. It proposes a comprehensive strategy and investment plan for extending Morocco's protected area network and conserving its biodiversity, and is the basis of the present project proposal.

At least 40 percent of the forest area in Morocco, represents the livestock range area. Due to the population pressure on the agricultural lands the period spent yearly by livestock in the forests has steadily increased. This increased pressure has had the negative effect of diluting the traditional methods of collective rangeland management and gradual abandonment of range rotation. As a result, regeneration is significantly reduced which in turn is reducing the productivity of the rangelands, and eventual degradation of the environment. On the positive side, the presence of the livestock has helped reduce the incidences of fire in the forests.

Contribution to the economy

The forest's most important contribution is ecological, that is, the protection of watersheds and safeguarding of water supplies, agricultural production and wildlife and arresting erosion of sensitive soils. The share of value added by the forests to the GDP was estimated in 1989 to be about 2 percent, which is 12 percent of the agricultural value added. This value is unlikely to have changed much, taking into consideration that the increase in the forests, since this date, is probably no more than approximately 4000 ha of new plantations added. Another significant contribution of the Moroccan forests is as a source of firewood, an important source of energy for the rural population. It has been estimated that at least 85 percent of Morocco's domestic energy needs are met from firewood and agricultural wastes, which is equivalent to approximately 10 million m³ of wood. This value exceeds the national forest's sustainable yield estimated at 3 million m³ of wood for all different purposes, and is a major contributing cause of deforestation. In addition, the forests do provide a source of employment for the rural poor.

Budget allocations

Budget allocations for reforestation activities originate from the Government budget (at least 60 percent); 20 percent from the National Forestry Fund, 10 percent from soil conservation programs and a large part of the remainder from the communal budgets. Only 1 percent of the budget comes from private sources.

Major factors affecting forests

The large nomadic populations generally have large herds which essentially prevent natural regeneration and contributes to the degeneration of the vegetative cover in Morocco. The principal threats to biodiversity are habitat transformation and fragmentation for agriculture and other human uses, and degradation through

habitat conversion for agriculture, urban expansion and industrial or tourism development including poor management of natural resources. In addition, approximately 70 percent of Morocco's poorest population (49 percent of total population) lives in rural areas, increasing pressure on natural resources. Soil erosion by wind, in the arid areas in the south and by water, in the water catchments in the mountains in the north is another factor directly linked to the reduced forest cover in Morocco.

Focus of forestry activities

Generally the Government has 3 main long-term objectives for the forest sector: (a) protection and conservation of natural resources through measures against deforestation, erosion and desertification; (b) maintenance of forest cover by demarcation of the forest estate, rationalizing wood extraction and forest range management and increase regeneration of the natural forest plantation establishment; and (c) improving the forest infrastructure and strengthening forest management based forest inventory studies and the preparation of forest management plans.

As is the evolving trend in the other countries in the region, the focus in forest activities has been shifting from implementation of pure forestry projects, to having projects that are more integrated in nature, including a wide range of other natural resources. This trend is bound to continue as results from these activities prove to be more beneficial as they tackle a wider range of issues. For example, watershed management in Morocco has in the recent years become a very important part of forest conservation and management, especially as Morocco suffers from serious soil erosion, by wind in the arid areas in the south and by water in the water catchments in mountains in the north where the majority of the dams are located. Treatment is being undertaken to reduce siltation of dams and reduce dam capacity losses. The Government is now requiring, as part of the financing for new dams, that funds for watershed management are made available. However, management plans for the protection and development of a large part of the watersheds are as yet non-existent. However, some effort will also continue to be placed on tree planting of commercial value, such as eucalyptus, for pulp production.

Livestock rearing in Morocco is very important, especially as they are a supplemental source of revenue for agricultural production. In the drier areas, where agriculture production is limited by the low rainfall, they are an important source of revenue. The limited availability of grazing areas, coupled with the increasing population pressure on agricultural land means that livestock is spending more time in the forests. This increased pressure on the forests is causing degradation on the forest undercover. Although this has the effect of limiting forest fires, it has an overall negative impact on the forest ecosystem.

Research

In recent years, research has focused on eucalyptus management, although research has in the past also covered subjects that include indigenous, productive forest (cork oak and cedar) and the biology and control of various forest insect pests and pathogens. Eucalypti have become immensely interesting in the Moroccan context for the purposes of pulp production.

Institutional framework

The Ministry of Forestry and Water has the overall responsibility for the development of the forestry sector. Through its jurisdiction over the provincial administration, the communes and the tribal collectives, the Ministry of Interior (MOI) also plays an important role in the Forestry Sector. Morocco is divided into 40 administrative provinces headed by a governor reporting to the MOI, who has the responsibility for developing the province. The governor approves the decisions of local authorities, including communal budgets which also include forestry investments. Lands owned collectively by tribes are under the trusteeship of the MOI, and thereby the implementation of any forest plantation and pasture development on these lands. The Ministry

of Forest and Water operates in the provinces through the Regional Directorates of Forestry and Water (DREF). The internal structure of the DREFs is generally identical to the structure at headquarters.

Institutional responsibilities for protected area management are well-established in Morocco. The agency with direct responsibility for protected area management is the Ministry of Water and Forestry. It has a well-established administration at regional and local level. The National Council for the Environment within the Ministry of the Environment provides overall policy guidance.

Regulatory framework

The basic law, Dahir, provides that forests are in the public domain and vests the Ministry of Forestry and Water (MWF) with the responsibility for their oversight. The law allows for the traditional usufruct for populations living in and around the forests for grazing and gathering of forestry products for personal use within the limits of available resources, as determined by the MWF. The law requires that the MWF establish, in consultation with the concerned communities, plans for each forest, outlining those areas in which grazing and gathering is permitted, those areas to be closed off for regeneration activities and measures to improve forest pastures. Generally, no more than 20 percent of the forest is closed at any given time to these users. Clearing and logging of privately or collectively owned woods can also be restricted by the law.

The law also allows the MWF to designate as a protected area, any land threatened with erosion and to undertake works in this area to prevent further erosion. It also gives communal councils the responsibility for organizing the use of the forests within the parameters established by MWF. Revenues derived from a forest are allocated to the budget of the commune in the territorial jurisdiction of which the forest is located. In turn, the commune is required to apply at least 20 percent of these revenues to investments in the forestry sector. Unfortunately this money is sent directly to the communes without deducting the maintenance costs and regeneration of forest resources which is still paid for by the now reduced Government budget.

Ownership Characteristics

Virtually all of the area under natural forest and esparto grass is state owned, although based on tradition, local and nomad populations exercise grazing rights. Seventy-seven percent of the plantation area is state owned, 16 percent collectively owned and at least 7 percent is privately owned. Although a large effort has been undertaken in the recently completed Second Forestry Development Project, there is still a sizeable amount of land that has not yet been demarcated.

Poverty and sustainability

A large part of the forests, including those designated as National Parks, are located in areas where the poorest part of the population lives. Although little information is available on household usage of fuelwood, it is the major source of energy for the rural poor as is one of the main factors responsible for the deforestation and desertification in Morocco. The increasing population pressure and the resultant over-exploitation of the forests in Morocco further complicates the poverty/sustainability issue. Women play an important role in forest use, not only through firewood collection, but also through livestock management, and the collection of other minor forest products, such as honey, mushrooms, acorns, either for supplemental revenue generation through sales or for consumption. The Government has realized that for the forest resources to be sustainable, not only should the participation of all stakeholders be encouraged, but the public in general will need to be sensitized and informed on the sustainable management of the forest's resources. An example of such an initiative is in the Protected Areas Management Project, GEF funded – under preparation, which includes a component targeted at public awareness on related issues.

Implementation of the forestry operations

Implementation of the Forestry activities is the main responsibility of the Ministry of Forestry and Water. However, implementation of any forestry activities on tribal collective land is the Ministry of the interior. Among the responsibilities of the Ministry of Forestry and Water are the management and protection of Morocco's forest estate, the protection of the country's watersheds and the prevention of the gradual desertification of its sensitive soils. Implementing of these tasks is limited by the fact that there are still areas that are as yet to be demarcated and therefore do not have any management plans. This lack, further constraints the development of watersheds and slyvo-pastoral activities. Although the Bank funded Second Forestry Development Project has significantly contributed to alleviating this problem, the problem is not eradicated. The private sector are involved in forest activities mainly in wood extraction under the supervision of the Ministry of Forest and Water.

Participation

In Morocco, the main stakeholders are the Government and the populations who either collectively own the forests or are depended on the forests. The objectives of these main stakeholders have generally tended to be very divergent, one being protectionist and the other utilitarian. Implementation has therefore tended to protect the forests and exclude access of the populations. This has caused a lot of tension and animosity between the populations and the administration. However, since the past 10 years or so, the Government has come to realize that without implicating the populations, the results of their efforts were neither sustainable nor really protected. Slowly, the governments has been taking steps to remedy the situation by implicating the population in activities such as range management development and lately in forestry activities in general. Although the participation mechanisms are still rudimentary, it is clear that the Government now understands that without this participation it will be difficult to have any sustainability on this matter.

Participation has been especially limited in forest range management, which has resulted in the failure of a number of initiatives and projects undertaken by the Government – in particular the concerned populations refused the reduction in grazing areas. Subsequent projects that included participation as an important part of implementation have realized some degree of success.

Valuation of forests

It has been estimated that about 45 percent of the natural forest and 40 percent of the esparto grass areas are suitable for commercial exploitation (saw-timber, wood pulp and cork). The rest of the areas have as an objective, a protective soil conservation function. Moroccan forests are a major world supplier of cork, and of some pulp. However, in reality domestic forest production only meets one-third of demand for sawnwood, pulpwood and other wood products. Imports represent 7 percent of raw materials and semi-finished goods, or 2.5 percent of total Moroccan imports. In addition, the quality of wood produced locally tends to be of a low-grade, mainly due to the poor harvesting techniques and the relatively unskilled labor used.

The processing industries for wood, tend to be small saw-mills, panel products industries, pulpmill and cork processing industries. The recovery rates of the sawmills are low, around 40 to 50 percent, and the logging and saw-milling of domestic forests are done by small scale operators who have limited technical experience and inadequate equipment, further devaluing the timber. Moreover, Morocco imports most of the pulp it consumes.

Markets

Marketing of forest products is administered by the Ministry of Forestry through annual descending auctions. Various taxes are added to the sale price. The money from the sales generally goes to the treasury and the Ministry of Forestry and Water is then re-allocated its budget. In general, wood products are sold standing.

Wood remaining from the auctions is generally sold as firewood, which is converted to charcoal on site for sale in the urban areas. Only one pulpwood mill is operational in Morocco. Up until 1993, the mill was able to purchase a significant proportion of its requirements in wood under a contract which greatly underestimated the production costs of that timber. The terms and conditions of this pulp-mill have now been changed to rid these distortions.

TUNISIA

Background

Tunisia has about 370,000 ha of natural forest and 290,000 ha of forest plantations. The production sub-sector was in 1993 valued at US\$110 million, at least 7 percent of the gross agriculture product or 1 percent of GNP. Production of industrial wood is 40 percent of the potential and only 50 percent of current demand. Available fuelwood could meet demand regionally but it is not located where it is needed, resulting in unbalanced use.

Forest types and ecosystems

Two groups of natural forests exist in Tunisia: (a) that growing in the humid/sub-humid climate with an annual rainfall between 550 mm and 1,500 mm. This forest comprises all cork oak forest and the maritime pine forest; and (b) the Aleppo pine forest which also includes stands of thuya, holm oak, and several other species. Annual rainfall is between 250 and 550 mm. It is in this second group, where conditions are hardest, that deforestation of river banks threatens the Aleppo pine forest the most.

The forests

About 4 percent of Tunisia is occupied by forests and national forests cover 900,000 ha, of which 368,400 ha are of natural forest (mainly cork oak, mixed zeen oak, maritime pine, aleppo pine, thuya, holm oak and others) 260,000 ha are plantations (pines, acacia and eucalyptus), 271,600 ha are scrubs, esparto grass and grazing land. In addition there are at least 30,000 ha of plantations on private or collective land, 1,683,000 ha of collective esparto grass and grazing land and 1,232,000ha of private scrubs and grazing land.

The most important function of the Tunisian forest is to protect and enhance agricultural productivity by preventing the closely related phenomena of desert encroachment and soil erosion. The greatest production from the forests has been in forage and fuelwood (wood and charcoal) used mainly by the local populations residing within 5km of the state forests and having rights to forest products. Quantities of fuelwood cut each year by the Forest Services for sale is only a fraction of the wood taken by right holders; the actual quantities of wood removed from the forest, legally and illegally is considerably larger.

Contribution to the economy

In 1993, the total value of production of the forestry sub-sector was estimated at about US\$110 million or 7 percent of the gross agriculture product or 1 percent of GNP. Domestic demand for wood and wood products is dominated by fuelwood which accounts for 87 percent of total demand. The remaining demand is for agricultural and mining timber, chip wood and sawn wood. (Local timber is not highly priced. It is has been estimated that even if sustainable management of fuelwood were carried out, the demand would still outstrip production by at least 56 percent). Although production of industrial wood has increased significantly in recent years, it is still only 40 percent of the potential and only 50 percent of the current demand. It has also been estimated that existing fuel wood could probably meet demand regionally, but it is not located where needed resulting in unbalanced use. The forests also contribute significant indirect benefits through the reduction of

soil erosion and sedimentation of hydraulic infrastructure, regulation of water runoff, wildlife habitat and provision of recreation.

Budget allocations

A review of the budget situation to the sector in 1993, showed that while investments in the subsector from 1962-1974 were 25 percent of the entire agricultural sector, this dropped to about 6 percent. The reduction in the level of investment appears to be a result of the limited success of the forest operations during the 13 years of continued investment which were considered ineffective, as wood demand continued to outstrip production. However, this trend changed again and in the 1990s the Government again became committed to supporting forestry programs and protect natural resources.

Major factors affecting forests

The most serious threats to the forest are uncontrolled human use of the forest and grazing lands. The combination of human pressure, and often, poor soils and low rainfall results in low growth rates in natural forests. Average growth rates in plantations are also poor, though through better selection of species, siting and improved techniques the yields have been increased. Another major factor putting pressure on the forests has been deforestation for the development of agricultural land for cereals and tree crops (since 1971, the estimated loss to agriculture has been estimated at 29,000 ha per year). Where conversion is carried out on land that is not suitable for agriculture, the result is generally that the land becomes degraded. Population and livestock pressure are causing deforestation and degradation of the vast esparto grass. Livestock production is an important traditional activity in the national forests estates. It is estimated that over 60 years Tunisia has lost at least a third of its forests and the remaining Aleppo pine and scrub forests continue to degrade. Erosion threatens about 3 million ha of which about half is already badly eroded. The largest effect of this erosion has been excessive water runoff causing siltation of reservoirs and degradation of agricultural land.

Focus of forestry activities

The Forestry Code, passed in 1988, focuses on measures to promote forest conservation, defines the national forest domain, specifies the rights of forestry users, promotes rangeland development and establishes rules for environment and wildlife protection. Tunisia has invested significantly in forestry development, although the impact of forest management remains insignificant. The constraints hampering the sector are more institutional and social than technical. Tunisia has implemented two "pure" forestry projects. However, as is the evolving trend in the other countries in the region, the focus in forest activities has been shifting from implementation of pure forestry projects, to having projects that are more integrated in nature, including a wide range of other natural resources. Livestock rearing, as is the case, in a majority of the regional countries is very important, especially as it supplements revenue from agricultural production. However, the limited availability of grazing areas, coupled with the increasing population pressure on agricultural land means that livestock is spending more time in the forests. This increased pressure on the forests is causing degradation on the forest undercover.

Research

Forest research was at one point a very important operation but due to financial difficulties its importance has significantly dropped. Between the 1960s and the 1970s, research was focused on solving problems of the humid and sub-humid zones. Since the 1970s staff reductions, and progressive isolation of the research institute from their partners in the forestry sector and the private end users have taken away from the relevance of research.

Institutional framework

The Directorate General of Forests (DGF) within the Ministry of Agriculture is the technical department in charge of managing the national forest estate and the public, private and collective forest and grazing lands under forestry regime. The DGF also assists, promotes and monitors private forestry development and manages national parks and reserves. At the regional level the DGF is represented by the Provincial Forestry Services. Soil and Water conservation are the responsibility of the soil and water conservation directorates. For exploitation of forest products the DGF relies on the Directorate of Forest Exploitation. Research is the responsibility of the National Institute of Forestry Research.

Implementation of the forest management and conservation plans are hampered by limited staff, equipment and funding. In addition, institutions are not adequately equipped to develop maximum added value for harvested wood, nor do they possess sufficient incentives to enable the development of smaller private entrepreneurs. Although the Forest Code was designed, to also promote private sector involvement in the implementation of forest operations, the legal basis for financial support and incentives to entrepreneurs has been lacking and this objective is still to be realized.

Regulatory framework

The key instrument guiding forestry activities in Tunisia is, the Forestry Code, established in 1988. As mentioned above, the Code focuses on measures to promote forest conservation, defines the national forest domain, specifies the rights of forestry users (about 800 000 people) promotes rangeland development and establishes rules for environment and wildlife protection. The Code also gives populations living in the National Forest Estate (NFE) user rights.

Ownership characteristics

Forty-nine percent of the total land area is owned by the public sector. Almost all rangeland is either private or collectively owned and most forest land is state owned. In the state domain, the state gives user rights to individuals/communities; while the management for collective rangelands, is in cooperation with the representatives of the populations which have access rights. Land tenure has the typical problems of lack of tenure security, fragmentation of holdings, poor management of resources by absentee landlords and rather than possessing land titles they have certificates of possession. These factors reduce investment on land. The parceling of land in Tunisia breaks landscape complementarities and the size of holdings, both of which render conservation of the land very difficult.

Poverty and sustainability

At least 37 percent of the Tunisian population is living in the rural areas, and the majority of these residents depend on agriculture as the main source of income. At least 87 percent of all demand on forestry is for fuelwood, with four fifth of rural household energy being supplied by fuel wood. The continual growth in the rural population requires that an accurate assessment of the fuelwood situation is made. Over 800,000 people are dependent to varying degrees upon forestry, for employment, fuel wood, and grazing and other forest products. The livestock herd is increasing, with cattle and poultry increasing at the highest pace. This increase coupled with inadequate feed quality, quantity, limited water, and the low quality of breeds results in increased degradation of the forests.

Implementation of the forestry operation

There is still need to increase participation of the private sector and strengthen user's associations. In 1993, it was estimated that at least 60 percent of the harvesting of forests are by the private sector – wood is sold standing.

Participation

In the first forestry project, participation of the population was mainly through their involvement as labor in the project, though some involvement of the population was undertaken in the rangeland operations associated with forest regeneration and plantations. However, it became apparent through this first forestry project and other projects in the agricultural and water sector that participation of the population for a sustained result was crucial. Although this was greatly enhanced in the design of the follow-on project, there is still need to increase focus on the local population when planning, executing, and operating forestry development programs, in particular to reduce human and cattle pressure on forest rangelands and to assist forest regeneration. Participation has tended to be higher in those projects that are more rural development oriented, and specifically use participation as a key methodology in the implementation of projects.

Valuation of forests

Presently the value of Tunisian forests is not perceived highly by local manufacturers. The low valuation of the forests, apart from cork oak, is linked to weak silvicultural techniques, poor harvesting techniques and low recovery rates. So far there have not been that many incentives to produce a high quality timber as a large part of the plantations are Government owned, and the costs of establishment are hardly ever calculated against the harvesting costs, both of which are paid by the Government. There are no incentives for the DGF to make money from the forests.

Sustainability

Sustainability of forest resources can only be achieved through the promotion of sustainable integrated development and management of the forest resources with an active involvement of the forestry population and the private sector. The integrated management will at the same time increase the environmental services of the forests, tackle the poverty issue of the local populations dependent on these resources, increase wood supply, relieve grazing pressure on the forests and preserve biodiversity.

To achieve sustainability of the resources several measures would have to be undertaken: - i) inclusion of the private sector (was proposed by the Government – but no provision of incentive structure); ii) get all the different players involved, i.e., other sectors, and coordination of all players; iii) provision of financial and institutional support for the emergence of private enterprises in forest/natural resource management; and iv) tackle land tenure issues which are a major disincentive. The balance for sustainability is delicate in a country that is highly dependent on agriculture – 16 percent of GDP and employs about 25 of the population. More emphasis will need to be placed on better agricultural practices that require limited deforestation and maximization of available land.

Economic and policy issues

Unlike agricultural commodities, there is no international reference price for much of the Tunisian wood production. However, there is a clear internal pricing policy. Wood is sold on the following terms i) fixed prices to the forest population and public entities; ii) by agreement, for small quantities that do not justify the organization of auctions; and c) by auction, both for stacked wood and tree stands. For imported wood, a complicated pricing system is used, with several duties charged. Raw-cork production is sold in its entirety by DREF to a parastatal company. The prices of the cork are set by the DREF and the purchasing parastatal.

The support for cereal production has fueled growth in the livestock population and eventual degradation of forest lands. This trend is fairly clear in the center of the country where good pasture is being converted to agriculture. The steady increase of barley in the feed for animals could fuel the conversion of forest land exacerbating land degradation further. In addition, the complexities and uncertainties of tenure arrangements in Tunisia have hampered reforestation activities. Furthermore, the parceling of land, mainly due to inheritance traditions result in the average piece of land per family that is very small, and forest activities become impossible.

ARAB REPUBLIC OF EGYPT

Forest ecosystems

Egypt has very little forest cover, mainly because of the limited rainfall, which makes growing conditions very harsh. Those that have been able to grow, the quality is low, with the trees being short and of not much commercial value. The most important forest in Egypt is the petrified forest, which is one of the oldest and most important forests in the country.

Focus of forestry

The main focus has been on planting wind breaks, to protect agricultural land, and establishment of plantations along canals. Of late there has been some interest in the potential of forest establishments using treated water. Although this would still be limited by the availability of such water, it is an important proposal with regards increasing tree cover. The quality of the plantations are probably unlikely to be of commercial value, but they would serve a very important environmental service.

Contribution to the economy

Because of the limited quantity, forests do not significantly contribute to GDP.

Value of forests

The direct contribution of forestry is limited, in fact, Egypt is a net importer. The wood scarcity and the high import ratio results in high prices of wood. In 1996, it was estimated that Egypt imported \$740 million of commercial timber and over \$3 million of firewood. The indirect value of forests is significant, with forests having an indirect value as shelter against desertification, soil erosion and dune formation.

ISLAMIC REPUBLIC OF IRAN

Background

Iran has approximately 12 million ha of forest area, most of which is suffering the consequences of deforestation. The average rainfall in Iran is low, ranging from 204 mm in the South, to 246 mm in the North. Iran has a rugged mountainous rim; high central basin with deserts, and mountains and small, discontinuous plains along both coasts. The substantial land resources cover 165 million ha. Cultivated agricultural land is only 11 percent of total area. Forest and rangeland including marginal and scrub lands, occupy 37 percent of the land area. The remaining land area, approximately 2 percent is under urban use.

Forest types and ecosystems

The Zagros Mountains on the western border house semi-humid forests with oak, elm, pistachio, and walnut. The Caspian Plain contains lush deciduous forests with ash, elm, oak and beech. During the last 30 years, 1.2 million ha, about 40 percent of the country's deciduous temperate forests have vanished due to irrational land use practices and poor management consequently leading to a loss in biodiversity. Iran, amongst the south-western Asian countries, possesses the most diversified biological region, supporting around 7,000 plant species of which 20 percent are endemic, including a wide range of medicinal and aromatic species and 500 bird species. The Wetlands of Iran are a resting area for migratory birds such as the Siberian Crane, Flamingoes, Pelicans, grebes, cormorants, ducks, geese, swans), and home to approximately 148 species of mammals (deer, leopard and cheetah). The areas protected under the National Parks are outstanding samples of biodiversity and ecology, great geological scenic resources of national and global importance and are protected by law. Of the 7 national parks in Iran, 2 are semi-degraded and 2 are degraded. Poaching is threatening the wild life refuges.

Major factors affecting forests

It is estimated that Iran is losing approximately 200,000 ha/yr to deforestation. It is estimated that between 1960 and 1990, the forests in Iran have been reduced from 17 million ha to 12 million ha. This 30 percent forest reduction over the last thirty years, can be attributed to the clearing of land for agricultural use, forage production and grazing, firewood and charcoal production. The Caspian and Zagrosian forests are estimated to have been reduced by 50 percent in the same time period. Approximately 67 percent of the forests are now considered degraded (8 million ha). For the Caspian forests, where the rate of decline was 3.5 percent per year from 1980-93 the forest cover could decline by about 50 percent by 2010 if this trend continues. The environmental and land utilization pressures on the forests are even greater outside of the Caspian forests, where a disproportionate amount of hectares are lost to deforestation each year.

The high population pressure, estimated to be increasing at an annual rate of 3.2 percent, is putting pressure on Iran's limited productive land resources. The population, estimated in 1997, at over 67 million people is expected to double over the next 25 years. In addition, a large portion of Iran's limited resources, over 80 percent, are in protected areas and the tremendous pressure from overgrazing, the lack of systematic monitoring of land use patterns, cutting of shrubs and bushes for fuel by villagers, conversion of land for agricultural uses, and the failure to include the participation of the local communities are all significantly contributing to the degradation of forests. This removal of trees and vegetation cover is estimated to be contributing to at least 43 percent to soil erosion in Iran.

Livestock rearing is an important part of the production systems in Iran and the shortage of grazing land is pushing people to graze their livestock in the forests. Livestock populations are estimated at roughly 3 times the feed production capacity of existing rangelands, and have grown at approximately 2.2 percent per year since the early 1960's. If this trend were to continue unchecked then by 2010 the livestock population could be approximately 50 percent higher than it is now. On the other hand grazing lands are decreasing at an estimated rate of 1.5 percent per year, and contribute to only 25 percent of the feed requirements. Subsidized farm inputs are further encouraging the conversion of forest and range lands into croplands, even where the land is fragile and is subsequently eroded. Erosion is also a major natural resource problem. An estimated 5 million ha of Iran's croplands are degraded (approximately a third). Available preliminary estimates show that Iran is annually losing about Rls. 850 billion (about US\$ 500 million) due to land degradation, with a major part of this loss arising from deforestation, soil erosion in watersheds and inefficient use of water in irrigated areas.

Contribution to the economy

Contribution from the forests is varied by region. In the Caspian region, where the forests are denser and the species are of higher value, the contribution is higher. However, as there are no figures on the contribution to the economy, the estimated losses from their destruction is a measure of the potential contribution that could be derived if these forests were managed in a sustainable manner. For the Caspian region, annual damages/wood losses are estimated at US\$154 million or about US\$3000 per hectare while for the rest of Iran, damages represent only US\$63 per deforested ha (because they are primarily for fuelwood and protection purposes).

Although not quantified, forest industries in Iran produce sawn-wood and particleboard, as well as pulp and paper from hardwood species. Important non-wood forest products in Iran include natural colorants and dyestuffs, henna, aromatic plants and essential oils, honey, pistachios, walnuts, gum and medicinal plants.

Budget allocations

Little information exists on the budget allocations to forestry/natural resource management. The allocation in the Forest and Range Organization (within MOJ) was estimated for 1992-3 to be US\$68.1 million. However, it is clear that the present allocations are insufficient to cover all the afforestation, natural resource management and watershed management activities that are considered priority.

Focus on forestry activities

The policy is based on management, afforestation and community forestry. The focus of forestry in Iran has been with the objective of attaining conservation against erosion and desertification, reducing the use of trees as fuel wood, reducing air pollution and the conservation of biodiversity. Watershed conservation is being considered priority in catchments of existing and new schemes.

The Government has also began re-seeding activities to replace previously converted rangelands which had been abandoned after productivity decreased. Agroforestry has always been an important feature in Iranian farming and is being encouraged. The Training and Extension Department is actively participating in forestry extension work to encourage better forestry and natural resource management.

Research

The Central Research Institutes under the Ministry of Jihad-e-Sazandegi (MOJ) is responsible for wood testing and for research on rangeland regeneration and afforestation, soil and water conservation, and range productivity. In addition, the Ministry of Agriculture Research, Training and Extension Organization is responsible for planning, financing, monitoring and evaluating the research programs for all of Iran. This organization controls research budgets, approves research strategy programs for Central Institutes and the Provincial Centers and includes an economics bureau.

Institutional and regulatory framework

Forests belong to the State, and are State managed. The responsibility for the natural resource sub-sectors, livestock, range, forestry, and fisheries were in 1990, transferred to the Ministry of Jihad- e –Sazandegi (MOJ). The Forest and Range Organization (FRO) within the MOJ is responsible for forestry. The institutional affiliation was designed to bring out the complementarity between natural resource management and the rural development activities which are at the heart of the MOJ's program. In principle MOJ now provides services to the whole rural sector. However, the separation of the natural resource management and livestock from crop production is a major problem for agricultural services, in particular when dealing with animal husbandry and rangelands.

Afforestation is the responsibility of the FRO's Forestry Department. Government supports private nurseries for these plantations by underwriting the output of the private nurseries by purchasing unsold plants. The Deputy Ministry for Watershed Management was created in 1991 to deal with issues related to watershed management. The agency has sufficient man-power but lacks adequate finances to fund the watershed protection program. In addition, there has been little attempt to enforce existing regulations.

Forestry training and extension is the responsibility of the FRO's Training and Extension Department. The Range and soil Department's Anti-Desertification Service is responsible for anti-desertification work, and has conducted a successful campaign against sand dune encroachment.

Land ownership

After two land reforms four distinct kinds of farms can be seen: peasant family farms, tenant farms, large capitalist farms and international agri-businesses. Students, the army, rural communities have been involved in the reforestation, which has reduced establishment costs and increased ownership of projects by the population.

Participation

The Government realizes the importance of participation in forestry activities, and has began to encourage the formation of cooperatives on at least 1 million hectares of forest lands, for which management plans exist. In these areas, MOJ has fashioned a program of activities that give emphasis to structured participation with a strategic role for the state as a catalyst and facilitator, and not the primary implementing agency. Participatory institutions in rural areas include the Islamic Rural Councils, village centers, village libraries, and the cooperative structure. MOJ gives the major implementation and management role to the villagers and has training officers at the provincial and local levels who support these efforts.

The importance of livestock as an agricultural production system, that has an impact on the welfare of the forests has also increased the awareness on the importance of including local participation in any resource management activities.

Poverty and sustainability

The annual cut of fuelwood is estimated at approximately 6.3 million m³/yr of which 3.7 million m³ is non-monetized consumption. The estimated sustainable yield level is 3.9 million m³ per year, and therefore the harvest exceeds the sustainable yield by approximately 62 percent. It is clear that a large portion of the forests harvested are for the purposes of firewood, the main source of energy for the rural populations. The scheme being piloted by the Forestry Department, to assist the removal of forest dwellers to well-equipped farms outside the forest should assist in reducing pressure, both of deforestation and grazing on the forests.

LEBANON

Background

The narrow coastal plain and the two mountain ranges, mount Lebanon and the anti-Lebanon running parallel to the coast, dominate the physical environment of Lebanon. At least 60 percent of the estimated 3.0 million people (1994 estimate), live along the coastal areas, and the remaining 31 percent live in the greater Beirut area.

Forest types and ecosystems

The diversity of climatic, topographic and soil characteristics create a rich array of ecosystems, which include, coastal, mountainous, and semi-desert systems. A major part of these systems are fragile climax ecosystems with low resilience, and disturbances have considerable ecological implications. Forest cover in Lebanon is very limited, covering 66 000 ha of the 10,500 km² of Lebanon's total surface area. This area includes protected areas and a natural reserve. Of the 66 000 ha only 10 000 ha are high forest. Fifty-two percent of Lebanon's land area is rocky, non-cultivated and degraded rangelands.

Lebanon has four areas that are considered to have global significance, and are a focus of protection efforts. The palm islands, offshore of Tripoli are a wetland of major importance and the breeding site for the endangered seagull. Unfortunately, it is threatened by illegal hunting, disturbance by visitors, fishing etc. The Ammiq swamp is important for migrating birds, but is threatened by agricultural intensification. The Barouk cedars, Barouk cedar forest (216 ha), apart from the cedars, which also contain conifers such as high juniper and maple, are the best known remaining stand of cedar forest in Lebanon. This park is affected by heavy hunting, disturbance by visitors, excessive soil erosion and fungal diseases affecting the cedars. The al Chouf cedars reserve, the southern most limit for some cedar species, is located in a mountainous area (1200 to 1900 meters) and represents an ecosystem of the central mount Lebanon chain. The Ehden forest is a rocky mountain forest area which contains many endemic plant species, but it is affected by illegal hunting, disturbance, uncontrolled logging (governance) activities and overgrazing, burning and human habitation. In addition, there has also been some initiative to privately protect some pine forests, such as those at Bentaeh and Yammouneh.

Among the fauna of biodiversity interest are the Syrian brown bear, the Asian leopard, Persian lynx, the deer, the Arabian gazelle, and the golden hamster, lion (disappeared in the 16th century). Species close to extinction are the wolf, the wild cat, the mongoose, the squirrel, three shrews, eleven bats, weasel and spiny mouse.

Major factors affecting forests. Land degradation, due to deforestation, soil erosion and inadequate management, is the major factor affecting forests in Lebanon. The worst degradation is on the fragile steeplands where there is extensive deforestation and soil erosion. It has been estimated that 2-3m³/year of soil are lost per year, a situation which could be halved by increasing forest cover. The erosion is resulting in loss of agricultural productivity, reservoir siltation and reduced water quality. Agricultural expansion into important wildlife habitats, for example, the Ammiq swamp is causing a loss of species in vulnerable areas. In addition, the twenty years of war in Lebanon has also caused some major damage in the forests, in particular forest fires.

The high population density, estimated at over 400/km², is contributing significantly to deforestation, mainly by cutting trees for firewood, charcoal production and for use in small wood industries. Forest fires being set deliberately are also contributing to forest degradation. In addition, uncontrolled urban development, over-grazing, land reclamation, sand quarrying, and construction of tourist resorts are having a negative impact on forestry. The estimated annual cost of environment and natural resource degradation has been estimated at around US\$300 million (us\$100 million from air pollution; US\$85 million from degraded terraces, soil erosion and degraded rangelands).

Some other constraints raised are: grazing in forest areas; lack of coordination among the different environmental agencies; the lack of law enforcement incentives and individualism; lack of forest management; lack of data; and incomplete and scattered legislation.

Contribution to the economy

The exact contribution of Lebanon's forests to the economy is not known, but it is reported that the share going to forestry/environment has been steadily decreasing as illustrated by funds allocated to the Horizon

2000 environmental program. The program initially received US\$10 Million/year but this figure has been declining steadily to the presently reported US\$3.5 million/year. The total annual budget for the Ministry of Environment was, in 1995, estimated to be US\$5 Million.

Round-wood, fuel-wood and charcoal production has increased in the past seven years while industrial round-wood has remained stable at very low levels. The trade of forest production in 1997 showed an enormous deficit between the imports of forests products (US\$175,802,000) and the exports of forests products (US\$3,065,000). Lebanon's capacity in sawn-timber, plywood and paper is not sufficient to meet domestic demand and is complemented by imports. Verified data is currently unavailable on the significance of non-wood forest products in this country.

Focus of forestry activities in the Region

The focus on forestry is the reduction in soil erosion through the control of land degradation. To achieve this, the Government plans to build terraces on the steep slopes, carry out reforestation activities and increase forestry nurseries. This mix of natural resource management and forestry is likely to prevail, as large scale commercial forestry plantations are unlikely to be successful due to the difficulties in water availability.

Research

There does not appear to be any research that is targeted specifically to forestry. However, there is considerable research activities on environmental issues undertaken mainly by academic institutions. However, the research is generally not coordinated, and the results are not necessarily streamlined into implementation of activities.

Institutional and legal framework. Forestry is under the ministry of agriculture, which overlaps responsibilities with the ministry of the environment. Eight NGO are involved in environmental management, and in particular the Lebanese forum for the protection of the environment, is involved in reforestation activities, establishment of sanctuaries and campaigning for the protection of the environment. A large body of environmental laws exist, but a great majority of them are obsolete, lack coherence (new regulations were drawn up without taking into account the old ones); do not have provisions for implementation and are relatively weak because there is no clarity in responsibilities and coordination and the deterrents are insufficient. Nature reserves are managed by the ministry of environment (MOE) with assistance of GEF and UNDP.

Poverty

A large proportion of the population living in and around the forests are poor and are depended on the forest, mainly as a source of energy. The increasing populations, resultant deforestation, and conversion of forests into agricultural land complicates forests sustainability. Livestock rearing, to supplement agricultural income further complicates the sustainability issue, unless other viable means of income are found.

REPUBLIC OF YEMEN

Background

It is believed that many of the areas with annual rainfall above 300 mm, at one time carried good forest cover, but most of this has degenerated into open woodland and low scattered shrubs, from centuries of over-use. Yemen has the largest range of natural resources than any other Arabian Peninsular country. A large portion of this has, over long years, been converted into agricultural land, mainly assisted by terraces, to capture the limited water resources.

Forest types and ecosystems

Natural woods consist of maritime mangroves, wadi and desert shrubs, and savanna and mountain trees, most of which is now degraded into open woodland or low scattered shrubs, a result of centuries of overcutting and expansive stock grazing and clearance for crop production. On mountains bordering the Montane Plains, some remnants of Juniper woodlands remain. Also, on inaccessible mountains, individual trees often remain.

Yemen possesses three important forests that contain significant biodiversity, Jebel Bura'a, Hawf and Socotra island. The two former areas have very recently been protected with the help of GEF financing. Jebel Bura'a covers 4,100 ha and is located in a mountain valley along the west coast of the Red sea. It houses more than 22 vegetation types, some of which are endemic. This area although it is very small, it is under considerable human pressure. The other site, Hawf, covers 30,000 ha of mountain area and attains a maximum height of 1400 m, runs parallel to the Gulf of Aden coast and extends to the border with Oman. The forest is very lush monsoon forest, and is surrounded by an arid ecosystem in the rain shadow. This forest is unique in Yemen. This area, unlike Jebel Bura'a, is presently under less human pressure.

Socotra, measuring 125 x 42 km is the largest of the four islands of the archipelago. The north-central mountain ranges and wadis mark the wettest and botanically richest sections of the island. The densely vegetated valley of Muqadrihon Pass possesses a rich and diverse biodiversity. The plants on the island are harvested for a variety of products, fodder, medicine, gums and resins etc.

Contribution to the economy

The contribution to the economy in direct monetary contribution from forestry is not documented, but it is likely to be very small. However, forests clearly contribute significantly in terms of firewood, providing over 70 percent of the household energy. Its contribution to soil protection is evidenced by the significant soil degradation taking place in the country and the encroachment of sand on agricultural areas, due to lack of tree cover. Experimental plantings have shown the potential of slowing or even stopping this degradation.

Budget allocations

No information is available on the budgetary allocations to forestry activities, but taking the present activity in the country as an indicator, this would be relatively small.

Major factors affecting forests

In 1970, it was estimated that there were over 2.7 million ha of wooded vegetation, but this has since been halved. Forest degradation from over-exploitation for extraction of firewood and other smaller wood products. The steep, rugged highland areas are most vulnerable to soil erosion, due to reduced work or abandonment of the terraces. A large part of the rangelands are communally held, and it is estimated that ruminants obtain about half of their grazing and dry season requirements from rangelands. A significant part of what is left is obtained from forests. The weakening traditional pasture management practices, are leading to over-grazing. The availability of water transport which increases herder's access, leads to longer grazing periods and shorter recuperation cycles. The pressure from the overgrazing coupled with an expanding population is leading to forest destruction and degradation. Forests are under constant pressure from the harvesting of firewood and other small wood products. The Government has made efforts to reduce the use of firewood use by promoting the use of hydrocarbons (by subsidizing consumption). The deterioration in the conditions of the terraces, is leading to erosion in areas downstream, as well as contributing to the damage of watersheds. This problem is compounded by the breakdown of traditional range management practices and the current rate of cutting, and in the absence of a program for accelerating replanting, the area under woody cover is very threatened – and it has been quoted that there “is a high risk that Yemen will be devoid of trees by the end of the century”.

Focus of forestry activities in the Region

After the completion of a Government funded study in 1990, the focus was on alternative energy sources, particularly LPG. However, there is still no national policy, specifying demand/production strategies for wood and alternative sources of energy. In view of the large areas under private management strategies for forestry development need to be developed to focus on private sector operations.

A study carried out by ODA in 1989, highlighted the potential for agroforestry which exists in Yemen. The limiting factor was scarce water resources. To enhance the potential of agroforestry, it is necessary to show its comparative advantages – planting of trees as a cash crop and for its protective function. Although fruit tree planting has grown rapidly in the last few years, there has been little interest in tree planting for fuelwood, despite its potential as a cash crop.

Forestry research

Forestry research in Yemen began in 1980, through ODA funding, and subsequently covered forestry research, operations and extension. Research focused on land rehabilitation, sand dune stabilization, species provenance trials, agro-forestry, conservation of species and areas and seed collection.

Institutional and regulatory framework

The Ministry of Agriculture and Water Resources, through the Directorate General of Forestry and Rangelands (DGFR) is responsible for, among others, forestry and livestock production. Five departments exist in the directorate: Natural Woodland and Forest Survey; Rangeland Development; Afforestation and Desertification Control; Forest Nurseries; and Services and Coordination. The Supreme Council for Afforestation was established in 1975 to safeguard forestlands. Yemen lacks a comprehensive inventory of national forest resources, and it has very few gazetted forest or wildlife reserves, and a new and as yet implemented forest legislation. Institutional capacity is weak, and through the lack of active policy and strategies, the forestry departments have had little impact in carrying out forestry activities, apart from the operation of some seedling nurseries. There is no organized forest management. A forest policy was established in 1989 and adopted, at unification, as the basis for the Forest Law. The Law emphasizes land conservation, including anti-desertification, woodland management and community tree planting, development of education and forest extension, and substitution of alternative fuels to wood. A parallel law is being proposed for rangelands.

Ownership characteristics

Yemen does not have gazetted forests or wildlife reserves, most of the existing forest or woodland areas are owned by individuals or communities, which, under traditional management systems, retained a proportion of indigenous trees in their cultivation areas to provide shade and a source of fuelwood and fodder. In the traditional system, fuelwood collection was restricted to dead branches of trees collected from the ground. However, the increasing population pressures and the rising fuelwood prices are leading to the breakdown of these systems, and a large proportion of fuelwood is being derived from felled trees and roots.

Poverty and sustainability

Current consumption of firewood is estimated at 6 million m³ annually. Fuelwood provides 70 percent of household energy. Although the exploitation of oil and gas reserves is facilitating the transition to bottled gas, it is estimated that at least half of the population will continue to be reliant on fuelwood, as long as it is available.

Participation

Participation of local populations in forestry activities has generally not been very high, but this could also be due to a variety of factors such as, the fact that there has not really been organized forest management and the implementing institutions are weak.

Sustainability

Presently, the sustainability of forests in Yemen is unlikely, at the present rate of harvesting and minimal replacement rate. The high demand on the forests for grazing, firewood and other non-timber products, with no organized management or strategies makes the sustainability issue more complex. To tackle this problem, an integrated management strategy would have to be prepared for implementation with the local populations.

ARAB REPUBLIC OF SYRIA

Background

Syria covers a land area of 18.5 million ha, classified in four broad land-use categories: cultivable land (6.1 million ha); uncultivable land (3.8 million ha); steppe and pasture (7.9 million ha); and forests (0.7 million ha). Arid lands account for around 63 percent of the total land area. The population growth rate is the highest in the world, at 3.5 percent. The population is concentrated in the Aleppo-hama-homs-Damascus strip running north to south in the west of the country and in the coastal provinces.

Forest types and ecosystems

Forests occupy 723,000 ha or 3.8 percent of Syria's surface out of which an estimated 270,000 ha are man-made plantations, and only about 60,000 ha are currently productive. Most of the new plantations are located in low-rainfall areas, where they cover roadsides and hills in bare land, and are therefore mainly for ecological and aesthetic purposes.

The major natural forests are chiefly in the foothills and on high ground in the western part of the country, particularly in the province of Latikia, characterized by very high rainfall. Large low-elevation areas of scrub with oak predominate, as well as extensive pure crops of pine (*Pinus brutia*) in lower altitude areas. Two other oak species (*Q. aegilops* and *Q. serres*) form good dense stands on higher altitudes with better rainfall. The fir (*Abies cilicica*) and the cedar (*Cedrus libani*) are located on still higher altitudes (over 1000 m). Junipers and Pistachio are the main species found in the degraded forests of the provinces of Homs, Hama, and Hassakeh.

Major factors affecting forests

Over 200,000 ha of the forests are gradually degenerated, mainly because of over-grazing, over-cutting of fuel and charcoal production, clearing for cultivation and general lack of management. The reduced forest cover is leading to environmental degradation and desertification, which due to the afforestation program has been somewhat reduced.

Protected areas

Protected areas in Syria cover approximately 0.5 percent of the country, but the representation of different habitat types is not covered in a systematic way. Major habitat types and centers of endemism and sites of endangered species are poorly represented.

Contribution to the economy

No information exists on forest resources and the contribution of the forest sector to the economy. However, recent approximate estimates suggest that the contribution of the forestry production, industrial wood, fire wood, and charcoal is of minor significance in the GDP of the country. Syria produces only 5-6 percent of its wood requirements and imports the rest. The value of forest services, benefits, and influences are even harder to quantify but in a country as widely arid as Syria, where forests provide stable feed for large numbers of grazing animals, they play a significant role in water catchment protection, desertification control, and prevention of soil erosion and flooding, they are important ecosystems for fauna and flora preservation, they are a source of medicinal and edible herbs, and are unique reserves of biological diversity, their contribution must be high.

Focus of forestry activities in the Region

The main general policy direction is to preserve existing natural forests and to create a core of forest plantations to cover around 15 percent of the country area. The primary function assigned to the forest cover is therefore mainly protection rather than production.

Ownership characteristics

After the agrarian reforms in the fifties and sixties, there was a shift from a free-market style to a centrally planned agriculture sector. More than 800 000 ha were appropriated and partly redistributed to small scale farmers. This trend is shifting again towards private-ownership.

Institutional and legal framework. Forests are the responsibility of the ministry of agriculture and agrarian reform, and their development and management is through the forestry and afforestation department. This agency is responsible for the protection, and exploitation of the forests. The department consists of four divisions, production, silviculture, protection and exploitation. However, less than 30 percent of the technical staff have training in forestry. There is no extension service and no specialized research body. The result is that key activities such as planning, statistics, surveying, research and extension are minimal. Another forestry body is the high commission for afforestation, established in 1977. It is responsible for promoting the plantation of both forest and fruit trees, with a view to afforestation at least 15 percent of the country area. Other divisions involved in forestry are the range department, responsible for grazing lands; the department of soils and land classification, responsible for carrying out soil surveys and land categorization; the department of agrarian reform and state lands, which is responsible for controlling properties and complete the distribution of land under the agrarian reform program; and the general directorate of land records, mandated to administer real estate holdings and to keep the cadastre. The general commission for environmental affairs and the higher council for environmental safety are also involved in forestry. Formal development planning has been practiced through five-year development plans, and in the sixth plan (1986-1990) agriculture and irrigation have received more emphasis and were given top-priority in the seventh plan (1991-1995).

Although a forest policy exists (prepared in the 1960s and updated), no long-term forest policy has been officially adopted by the Government to prescribe long-term objectives in the forestry sector. As such, there is no structured detailed national strategy formally laid down for the development and conservation of the country's forests. The forestry program consists of no more than targets to be achieved and budgets to carry them out.

Regulatory framework

The Forestry Law is the basic enactment governing forestry in the country. The Forest Law was complemented by three other statutes: on the protection of trees and plantations against damage caused by goats; on the prohibition of grazing of certain animals in certain lands; and on the distribution of arid lands in

the forested regions of Syria. Forests are not explicitly covered in the updated version of the Law. However, it does cover, broadly, for the protection of flora, fauna, soil and natural resources. With the exception of forests occurring on privately-owned lands, the legal presumption is that all forests belong to the state. However, the Law does not provide for the procedures to be followed in constituting state forests. In particular, there is no mention of prior public inquiries allowing for existing rights of ownership or use to be preserved. Similarly, there is no mention with respect to declassification

The exploitation of forests is to be done through an approved exploitation system, which is not described, apart from the fact that the trees should be marked. Although prevention of forest fires is mentioned as a major problem in the updated Law, forest land clearing is not mentioned in the list of prohibited or restricted operations. The present regulations on private forestry development are limiting, and it is unlikely that this activity will increase if the rules remain unchanged.

JORDAN

Background

Jordan is a small country approximately 90,000 km². Forests cover a total area of 1165.49 km², of which only 405.94 km² are natural forest while the remaining 759.55 km² are plantations. Forests are the responsibility of the Forestry Department, in the Ministry of Agriculture, and the Royal Society for the Conservation of Nature, which is responsible for the management of the forests in its protected areas. Forest Management plans are implemented by the Forestry Department through a 10-year plan, lately recommended to be reduced to five-year plans. Forest research is conducted by the Forestry Department, botanists from local universities and by the Research & Survey Section at the Royal Society for the Conservation of Nature within its established and proposed protected areas and other areas of concern.

The forests of Jordan are limited to the mountain ranges that extend from Irbid in the North to Ras En-Naqab in the South. The soil in these forests are the most fertile soils in the country. There are four main different forest vegetation types in Jordan. All of these forest types belong to the Mediterranean bio-geographical zone, characterized as having the best rainfall (400-600mm/year), the highest altitude (900-1700m) and the best vegetation. Jordan's forests are rich in different flora, with many species, such as the wild pear (*Pyrus syriaca*), wild pistachios (*Pistachio sp*) hawthorn (*Crataegus sp*) and others which are grafted on to various varieties of pear, pistachio and apples. It also contains a good number of wild legumes, wheat, barley and oats, as well as many other species either known or yet to be exploited. Within the main forest types briefly described below exists numerous other biodiversity important species. The four forest types are the following:

- **Pine forest:** The main species in these forests is the Aleppo Pine (*Pinus halepensis*). Aleppo pine reaches its southern limit in the world in Jordan. These forests usually occur on high altitudes, mostly over 700m. These pines are present only in the Northern parts of Jordan and are not represented in the Southern parts of Jordan (where the presence of pines are through plantation establishment). In the 1950s, the Ministry of Agriculture represented by the Department of Forestry carried out a program of reforestation in which most of the trees were Aleppo Pine trees. This is a potential protected area site. However, the high acidity of the Terra Rossa soil is hindering regeneration of natural Aleppo Pines. The degradation in these forests is causing a secondary succession by Evergreen Oak (*Quercus calliprinos*). Degradation of these trees is mainly related to their weak and shallow root system and also to their soft wood, which makes these trees easy to bend or uproot. Usually strong floods and heavy snow cause bending and uprooting. Fires are also causing degradation as the wood of these trees is susceptible to fire. The forests are very popular camping sites which is placing significant pressure on them.

- **Evergreen oak forest.** This vegetation is the most dominant forest vegetation in Jordan. It occurs in the Northern, Middle and Southern parts of the country, unlike other forest vegetation types that occur in restricted areas. The dominant tree species is the Evergreen Oak (*Quercus calliprinos*). This type of vegetation occurs at high elevation (above 700m) and extends from Wadi Es-Sir near Amman up to Irbid in the North, but is also found in the south. The best representative site for this forest is in Ishtafaina near Ajloun. The main impact on these forests has been the conversion of forest land to agricultural lands because the soils are highly fertile. The forests are also being cut for heating and coal production. This vegetation is also represented in Protected areas such as Zubia Nature Reserve and Dana Nature Reserve where it is mixed in some places with Juniper forest.
- **Deciduous oak forest.** The main species in this forest is *Quercus aegilops*. There are other deciduous oak species which include *Quercus infectoria* and *Quercus boissieri* that are present in this vegetation type. The altitude of this vegetation type is lower than all the other forest vegetation types and it occurs mostly on red or brown soil of hard limestone parental rock. Unfortunately, most of the areas in which this vegetation type occurs are not protected and therefore they are subjected to cutting and eventual degradation. The deciduous oak forests are usually found at the lower borders of the evergreen oak forests.
- **Phoenician juniper forest:** The leading species in this forest vegetation type is *Juniperus phoenica*. This occurs only in the Southern Mountains of Jordan usually at high altitudes (1500m), covering at least 7660 ha. This forest vegetation type occurs from Tafila to Ras En-Naqab. The whole vegetation type has suffered a great deal of human interaction. This forest type is relatively well protected in areas as the Dana Nature Reserve, established in 1992.
- **Cypress forest:-** A very small stand of *Cupressus sempervirens var. horizontalis* is found in an area within Dana Nature Reserve ranging in altitudes from 1200-1500 m where the annual precipitation is about 350 mm. It forms the most southern limit distribution of this species globally, with the lowest precipitation.

Plantations have been established in Jordan over the past 40 years and cover approximately 354 km². The species commonly planted are the local species: *Pinus halepensis*, *Cupressus sempervirens*, *Ceratonia siliqua*, *Pistacia sp* and *Tamarix sp.* and the exotic species: *Pinus brutia*, *P. canariensis*, *P. pinea*, *Acacia cyanophylla*, *Eucalyptus camaldulensis*, *Prosopis juliflora*, *Cupressus sp* and others. These plantations include belts of roadside plantations of about 1.000 km, and plantations along wadi courses of about 100 km.

Ownership characteristics

Forests are owned by the state with the exception of a few privately owned stands. Private forests are found in the northern part of Jordan and they are covered partially or completely with forest trees. Vegetation on wadis and all forest trees growing on lands belonging to Government institutions are managed by the forestry department according to agriculture law no:20 of 1973. The ownership status of these lands is regulated through the Government property law no. 17 of 1974 and Government properties release & rent law no.60 of 1964. Private forests are generally in the form of natural forest vegetation and private forest tree plantations on farms in the form of windbreakers and shelter belts. In 1964, an inventory of natural private forests estimated the area to be 54 km², but a recent survey shows that this figure has decreased by at least 15 percent due to their replacement by fruit trees. The current agricultural law permits owners to cut the existing forest trees on their lands according to a schedule that ensures the replacement of the forest trees by successful fruit trees after suitable soil conservation measures have been taken.

Wood production

Jordan's natural forests are not harvested for wood production. Any wood production from the forest is either from thinning, pruning, diseased trees or from the creation of fire breaks. A large part of the wood harvested is for fire wood, charcoal and for making small tools and wares such as axes and fences. Harvesting of this wood is supervised by the Forestry Department. The forests play a significant soil and water conservation role.

ANNEX 3: INPUT AND FEEDBACK FROM THE CONSULTATION MEETING

<i>Theme</i>	<i>Critical Issue</i>	<i>Recommendation to the World Bank</i>
Regional Specificities	<i>Desertification</i>	Desertification is a human induced process and should be a key factor determining the appreciation of the evolution of forests in the MENA region, and should be a focus for WB support
	<i>Integrated approaches (landscape, ecosystems)</i>	The development of such approaches is a critical issues for the region and for the World Bank
	<i>Knowledge</i>	Promote research and training using local expertise to enhance the knowledge base concerning Mediterranean forests and notably: Mapping of forest resources Inventories of forest resources Dynamics of forest ecosystems Evaluation of biological diversity
Forests	<i>Multipurpose forests</i>	New policy should accommodate the possibility of supporting multipurpose forests, and recognize the multiple values (economic, social and ecological) of forests
	<i>Non-timber forest products</i>	New policy should enable and encourage NTFP activities
	<i>Protection forests and priorities for conservation</i>	As with the 1991 policy, the new policy should clearly address forest conservation and protection issues, and the WB should promote concessional financing for conservation forests
Forests (cont'd)	<i>Values of forests and forest functions</i>	New policy needs to recognize the role of forests in assuring sustainable development and poverty alleviation. The relationship between structural adjustment and lending policies and forest conservation and management need to be better addressed. The various goods and services provided by forests need to be clearly identified within the Bank's policy. For example: NTFPs Ecotourism Livelihoods (including access to forest areas for fruit and timber by local people) Traditional use rights of local communities Policy should enable the identification of ecological and social "hot spots" for special attention

<i>Theme</i>	<i>Critical Issue</i>	<i>Recommendation to the World Bank</i>
Participation	<i>Multi sectoral approach</i>	New policy should clearly acknowledge links and influences between the forest and other sectors
	<i>Information dissemination</i>	New policy should encourage improvements in the provision of information to key stakeholders
	<i>Ensure that design, monitoring and evaluation mechanisms are able to accommodate participatory processes</i>	<p>New policy needs to strike a balance between the need to ensure that the design and M&E of projects is able to accommodate participatory processes while ensuring that investments are not unduly delayed. This may require longer design phases.</p> <p>The opportunities provided by community management of forests should be recognized and promoted in the new policy.</p>
Values	<i>Ecological services</i>	<p>New policy should recognize that forests have a range of values that are not always well integrated in economic valuations. These values include carbon sequestration, climate amelioration, soil and water conservation, protection of irrigated lands. Policy should promote the consideration of these values in economic and financial planning systems at the national and international levels.</p> <p>Ecological services should be taken into account at the design phase of projects. These services should be maintained and enhanced where practical.</p>
	<i>Economic values</i>	<p>New policy should consider and accommodate non-traditional economic values of forests, such as ecotourism and cultural values.</p> <p>New policy should encourage analysis of the ways in which requirements for forest products of various countries within the region can be better met at the national and regional level rather than through imports. Current trade figures for forest products show a negative balance for the region of US\$ 4 billion annually. Import substitution through increasing the productivity of existing forests and through reforestation where economically, environmentally and culturally viable.</p>
Impacts	<i>Impact assessments</i>	<p>New policy should promote better understanding of the positive and negative impacts of planned and implemented forest activities. This should include relevant research, monitoring and evaluation.</p> <p>Forest projects should be subject to environmental screening and where justified require full Environmental Impact Analyses for major investments in the forest sector.</p> <p>Influences and impacts on forests generated from beyond the region should be better understood and evaluated.</p>

Source: Report of the Middle East and North Africa Consultation Meeting, Tunis 23-25 February 2000.

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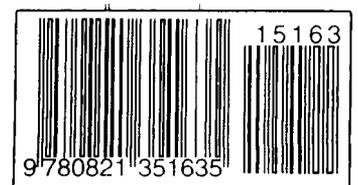
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