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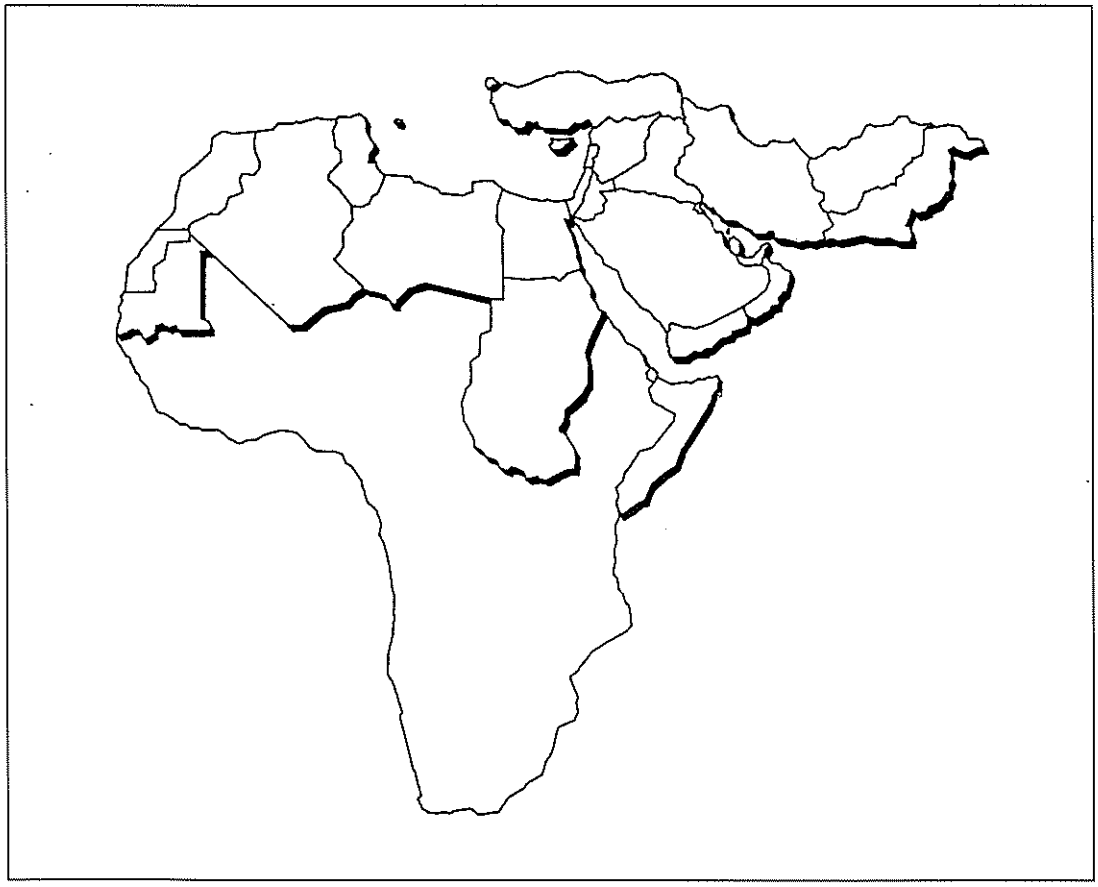
Forestry policies in the Near East region: analysis and synthesis



Food and Agriculture Organization of the United Nations

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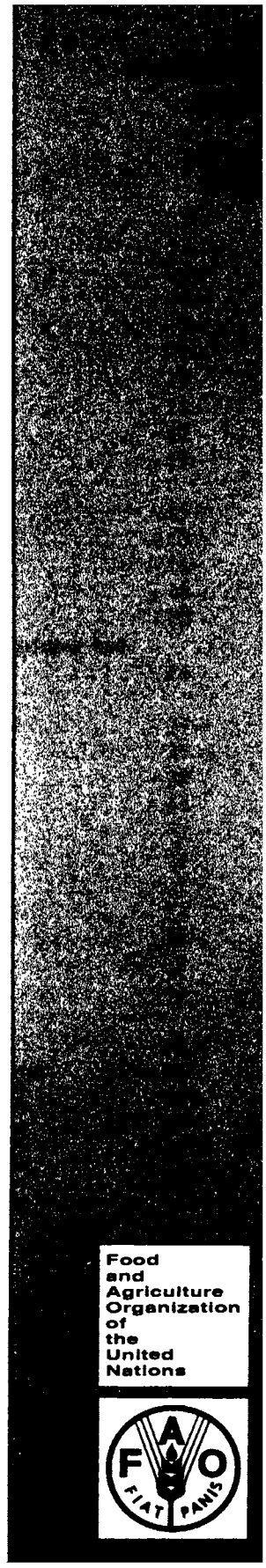

Food and Agriculture Organization of the United Nations

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FORWARD

As a part of its programme on forestry policy analysis and advice, the FAO Forestry Policy and Planning Division is carrying out a series of regional reviews of forestry policies.

This FORESTRY PAPER synthesizes information on forestry policies in the Near East Region as a result of the regional review carried out in 1990-92. The Paper is based on the responses of several countries of the Region to questionnaires prepared by FAO country reports, case studies, FAO reports and statistics, as well as other material produced and published by FAO.

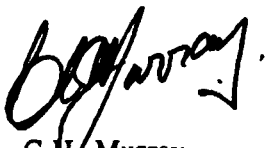
The emerging role of the forest in securing food and protecting the environment is gaining popular and official support in the Near East. The two issues are intricately interrelated in this Region, thus they must be addressed simultaneously. For instance, land degradation and reduced productivity due to soil erosion, salinization, sand encroachment, deforestation, over-grazing, urbanization, etc., invariably lead to a reduction in the land available for food production. The growing demand for food beyond the capabilities of productive soils - (food imports rose from US$ 1.4 billion in 1970 to US$ 20 billion in 1990) - has meanwhile necessitated expansion into marginal land and encouraged deforestation. On the other hand, the needs to extract wood and other products from the forest often conflicts with conservation strategies, hindering the conceptualization and implementation of sound forest policies. Environmental, social, economic and political diversities of the region have joined forces to exacerbate this problem. Nonetheless, some Near East countries do have well conceived and administered Forestry Policies, which could be mutually reinforcing if shared with other countries.

It is recognized that, although each country must determine its forestry policy within the context of its own development priorities, socio-economic parameters and conservation strategies, certain aspects of forestry policies are common and valid for the Region as a whole. Foremost among these are: forest land rehabilitation, afforestation, desertification control, protection, watershed management, amenity, environmental conservation, public awareness, education, training and extension.

While it is unrealistic to design and implement a common regional forestry policy for the Near East, it is crucial that the countries of the region coordinate their respective policies to avoid fragmented efforts and instead ensure complementarity and coherence of action. This is especially important in view of the rising awareness regarding sustainable development and environmental conservation in response to AGENDA 21 of UNCED. Some member states are undergoing macro economic reforms and structural adjustments, which will no doubt be reflected in their policies for natural resource management.

This paper is intended to analyze the Policy Statements of Near East countries, where they exist, and to highlight their attributes and deficiencies. The policies which have proved to be valid in some countries, could guide the preparation and/or revision in others countries. This publication would hopefully facilitate the exchange of information and experiences as well as the pooling of comparative advantages, in an era of global interdependence and reciprocity.

This analysis and synthesis was first drafted by Mr. A. Polycarpou, and subsequently revised by Dr. M.H. El-Lakany, Regional Forestry Officer, RNEA. It is published as a joint activity between the Forestry Policy and Planning Division of the Forestry Department and the FAO Regional Office for the Near East in Cairo, Egypt.



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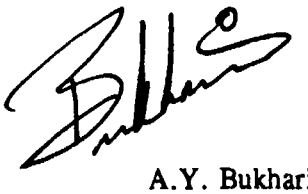

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1) INTRODUCTION

It is a well-established fact now that the countries of the Near East region are consumers of wood and other forest products. They are also characterized by highly degraded forests as a result of centuries of overuse and high human and animal pressures, exacerbated by harsh environmental conditions. The role of the forest in maintaining fragile ecosystems; providing energy, food and shelter to rural, and sometimes urban populations; and conserving the bio-diversity is diminishing at an alarming rate in the Near East. Nevertheless, several countries in the region have good potential for forestry development and sound management of their forest resources, if proper policies are drawn and implemented.

Unlike many industrialized countries, the forests of the Near East are largely on public land and the governments assume the authority and responsibility of managing them. Meanwhile, the indigenous communities exploit the forest, according to their own traditions, which sometimes do not concur with government policies. Such a conflict exerts more pressure on the forest, rendering its systematic management a difficult task.

Based upon available "Country Reports" prepared by national authorities, FAO documents, interviews and personal observations, it appears that each country of the Near East region has a Forestry Policy Statement. Yet, there are major differences, and often contradictions, in understanding the meaning of the term "Policy", on the basis of devising policy statements and in the procedures of implementation. The stated objectives, or at least the intentions of all policy statements are, however, achieving social welfare and protecting the forests. But while these are the ultimate objectives of practically all forestry policies everywhere in the relevant world, well conceived and effectively implemented policies are quite rare in the Near East region.

The aim of the present paper is not to induce the Near East governments to prepare Forestry Policy Statements, except where they are lacking, nor to dwell upon the importance of adapting policies for preserving the forests, as this concept is already in place, at least in principle. Rather, this paper intends primarily to review and synthesize the essential elements of Forestry Policies in the region where they exist, and to point out the positive and negative implications of such policies.

In-spite of the fact that the majority of the countries of the Near East region share some common ecological, social, and institutional characteristics, it would be ironic to attempt to devise general Forestry Policies for all countries. Instead, by pointing out the attributes and deficiencies of existing policies, it is hoped that this synthesis could lead to better understanding of the Forestry situation in the region and to assist some governments in formulating or reforming their Forestry Policies.

Many international agencies have called for the development of, and investment in, the forestry sectors of the Near East Region. Since Policy reforms will be essential prerequisites for such activities, this report seeks to shed some light on the issues where reform is highly desirable.

2) FORESTRY IN THE NEAR EAST REGION: A BACKGROUND

2.1. The Region

Under FAO's regional structure, the Near East Region (N.E.) comprises 26 countries[1], stretching over 17.5 million km² in Africa and Asia; from the Atlantic coast of Mauritania and the southern shores of the Mediterranean Sea, across the northern half of Africa, eastwards over the Arabian peninsula, the Iranian and Afghan plateaux to Pakistan. It includes Cyprus and Turkey in the north and Somalia and the Sudan in the South, (Figure 1).

The Near East is one of the oldest inhabited regions of the world where man has made a profound impact on the land and its resources. In two of the main river basins, the Mesopotamia and the Nile Valley, man developed agriculture over 10,000 years ago. The agricultural evolution was brought about with the cultivation of crops and the domestication of livestock. Civilizations originated in this region and succeeded one another for centuries.

Trade in food, metals and timber started in the region centuries ago; tons of copper and iron were melted and shaped into ornaments and implements, and millions of tons of clay were shaped and baked into bricks, pots and vases using firewood as a source of energy. With the exception of the relatively recent deforestation in the tropics, no other region of the world epitomizes so vividly the impact of man on forest resources as the Near East does.

Aridity is the dominant physical characteristic of the region. With few exceptions of high altitude areas, some 75% of the total area of the region is desert, and 15% are arid or semi-arid and cold mountainous lands. Ecologically, these zones are fragile and difficult to develop and use.

The physical characteristics of the region stem essentially from the combined effects of climate and topography, with maritime influences playing an important role. These characteristics are the major determinants of the use to which land is put, though it is also true that patterns of land-use over the centuries have shaped the physical framework at the local level.

Several sub-regions could be recognized in terms of physical environment. In general terms, there is the typical Mediterranean type, with dry, warm summers and cool, wet winters. To the south of the Mediterranean coastal strip in Africa, there is the arid zone which merges into the Sahara desert. In the east, the Mediterranean zone of the Levant merges into the Syrian, Jordanian and Iraqi deserts where rainfall is scarce. To the north and northeast there are areas with temperate and continental climates in Turkey, the Zagros mountains and other highlands of Iran, Afghanistan and Pakistan where snow falls in the winters. To the southeast there are patches of mangrove forests along the Indian Ocean; and the coastal areas of Arabia and Somalia, as well as dense forests in the tropical zone of southern Sudan.

The greatest part of the region is generally characterized by scarcity of precipitation and erratic pattern of rainfall distribution; extremely wide variations in temperature, both seasonal and diurnal; high wind velocities; hot dry winds in certain periods of the year and high evapotranspiration.

[1] These are: Mauritania, Morocco, Algeria, Tunisia, Libya, Egypt, Sudan, Somalia, Djibouti, Yemen, Oman, U.A. Emirates, Qatar, Bahrain, Kuwait, Saudi Arabia, Jordan, Syria, Lebanon, Iraq, Iran, Afghanistan, Pakistan, Turkey, Cyprus, and Malta.

Near East Region

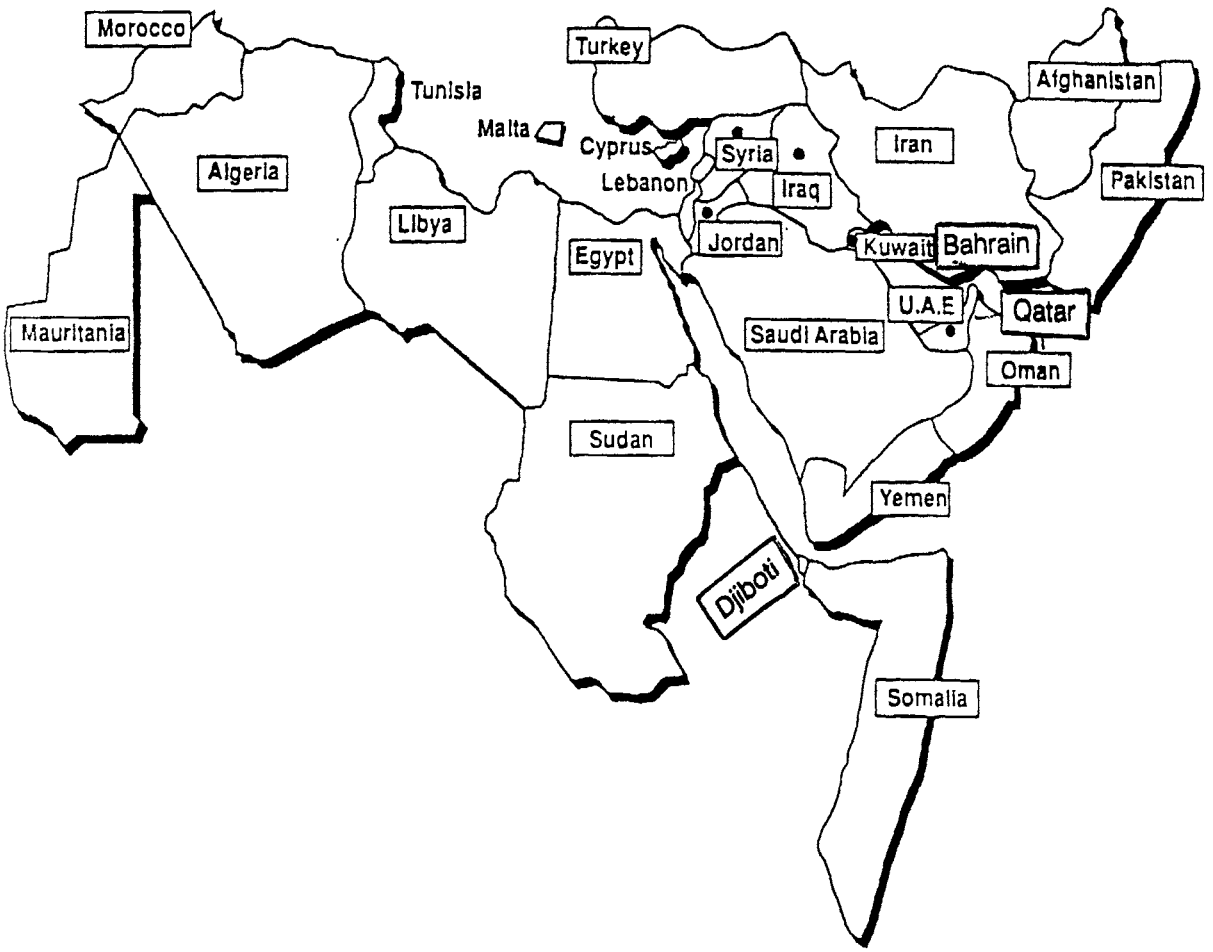

Fig. 1: Member Countries of the Near East Region

The total population of the region is estimated at 466 million (1990/1991), with a rate of growth averaging 3.1%; one of the highest in the world.

In terms of levels of economic development, the region is marked by striking disparities; some of the richest oil producing States with per capita incomes among the highest in the world and some of the poorest human societies are found in the region. With few exceptions, where commerce and industry are producing a sizeable proportion of the national income, agrarian economies and traditional societies and structures prevail.

The labour force of the region is neither fully nor effectively employed. A pervasive underemployment of labour is both a cause and an effect of the low levels of living in certain parts of the region. The surplus labour emigrates either to industrial western Europe or eastwards to the oil-rich States.

Although agriculture is the predominant activity in the region, its economic impact is extremely variable, with a share of total GDP ranging from one percent in some countries to sixty percent in others. Its share of the labour force varies from 2 to 80 percent and that of exports from less than one to almost 100 percent.

The focus in agricultural policies is understandably on food production. Yet, the region imports some 50 percent of its food to meet the increasing and diversifying needs of growing populations and burgeoning cities.

Possibilities for expanding the area under permanent irrigation are limited. Even in countries where substantial resources were invested for the expansion of irrigation, the area of land under irrigation has not increased proportionally. The probable reason is that large areas of irrigated land have gone out of production because of salinity and water logging, as well as other forms of land degradation. Thus, the drylands of the region are called upon to make increasing contributions to food production. This is pursued by bringing more land under the plough through speculative cultivation.

In most countries of the region, policy-makers have failed to place agriculture in its proper ecological context. Lower yields force the population to expand speculative cultivation into the drier, marginal lands, and/or into the forests, thus increasing the areas exposed to wind and water erosion and at the same time, reducing the area available for grazing.

The patterns of livestock production, whether nomadic or sedentary, are more or less the same in most countries of the region. They lag behind crop production in terms of development and standards of management and husbandry. Moreover, crop farming and livestock production are often carried out as separate economic activities and sometimes, antagonistic to land and water resources.

Long-term land-use policies do not exist in most countries of the region and where they have been formulated, the necessary political support and institutional mechanisms to implement such policies are inadequate. As a consequence, the processes of desertification in the form of land degradation, destruction of the vegetation cover, soil erosion and loss of soil fertility, moving sand dunes, extinction of indigenous plant and animal species are accelerating, nurturing the popular belief in the region that deserts are "creeping" and expanding.

2.2. Forest Resources in the Region

2.2.1. Forest vegetative type/land use

In the temperate zone, forests are considered to be those lands which carry stands of trees, usually of commercial value. With few exceptions, such as in the Atlas mountains, the highlands of Cyprus, Turkey, the Caspian Sea area, northern Pakistan and southern Sudan, forests of commercial timber do not exist in the Near East, except in isolated patches. The savanna and open woodlands, the scattered trees and xerophytic shrubs, the hydrophilous reeds in wetlands and the trees which are cultivated as windbreaks or along roads and canals (e.g. in Egypt) constitute the forest resources in the Near East.

For simplicity, the natural vegetation of the region may be classified into four main types or zones as follows:

a) The desert zone which covers Mauritania, the southern regions of the Maghreb countries, Libya and Egypt, Northern Sudan to the horn of Africa and extends eastwards to cover parts of Jordan, Syria, Iraq, the Arabian peninsula, Iran, Afghanistan and Pakistan. This zone has no forest vegetation of economic significance and offers no management options except for limited, localized and seasonal grazing in years of exceptional rain, unless drastically modified through irrigation and soil amelioration.

b) The arid zone which includes parts of North Africa, south of the Atlas, some plateaux within this mountain range itself, and areas which extend almost to the coast of the Mediterranean and Red Sea and the Indian Ocean. The arid zone includes vast areas with extremely poor vegetation of grasses, dwarf shrubs and occasional trees, widely scattered, with patches of land devoid of vegetation. When rain falls, the seeds of ephemeral plants germinate and for a brief period, the soil may be covered with plant life.

With increasing rainfall the density of vegetation becomes more frequent to include genera such as *Stipa* (grass), *Artemisia* (woody shrubs) and *Acacia* (trees). This gives way to open xerophilous woodland with trees such as *Argania*, *Pistachia*, *Zyziphus* and several Acacias. There are limited cropping possibilities outside the oases and river valleys. Management options in the arid areas are generally confined to extensive animal husbandry on the native pastures, the production of ligneous biomass for domestic energy needs, gathering of resins, gums, medicinal and aromatic substances and hunting of wildlife.

c) The semi-arid zone occurs in the north African coast, Cyprus, Southern Turkey, eastern Mediterranean coast, parts of the high plateaux of the Atlas, central Anatolian and Zagros Mountains into Afghanistan and Pakistan and parts of the Arabian Peninsula, Somalia and the Sudan.

The scrub and ephemeral vegetation of the arid zones give way, under conditions of higher rainfall in the semi-arid areas, to typical Mediterranean flora of evergreen trees and bushes, maquis, garique and batha. Olives, carobs, oaks have also their habitat here. Coniferous species, mainly *Pinus halepensis* (Aleppo pine) and *Pinus brutia* and *Cupressus* species prevail (in Turkey, Cyprus, Syria). Forests of *Juniperus* and *Callitris* species exist in small patches in North Africa and *Pinus pinea* is cultivated for its seeds around the Mediterranean coast.

The cork oak is of economic importance in Algeria, Morocco and Tunisia, while *Acacia* species are of greater importance to the Sudan, where gum arabic from *Acacia senegal* is a major source of foreign currency. In parts of Jordan, Iraq and the Arabian Peninsula *Tamarix* species are of economic importance along with *Zyziphus* and *Pistachia* species in Iran and Afghanistan.

d) The humid zone occupies part of the North African highlands, Turkey, the mountainous region from the Caspian Sea to the Himalayas, the mountains of Lebanon, Cyprus and the tropical zone of Southern Sudan. Most of the surviving remnants of the old forest are to be found in the humid, mountainous zone which include magnificent stands of *Quercus, Fagus, Carpinus, Abies, Pinus, Cedrus* and *Platanus* as well as *Alnus* in riverine areas. Tropical forests are represented in the South of the Sudan and mangrove forests in river deltas along the Indian Ocean coast of the region, as well as in small patches on the Red Sea.

Tree planting (manmade forests) has been an old tradition in many Near East countries. Among the cultivated forest trees, poplars occupy prominence in Turkey, Syria and Iraq. *Casuarina* predominates in irrigated land of Egypt and *Eucalyptus* species are grown widely in the rainfed areas of the region. More recently, some acacias (e.g. *A. saligna*) have been grown for sand dune stabilization and as a source of fodder.

The humid and semi-arid zones offer several management options such as arboriculture, food crops, fodder, wood and fuelwood production, intensive livestock raising and several combinations of uses. This intensifies and sharpens competition for the use of land and water resources in these zones and highlights the need for, and importance of, land-use planning.

Precipitation is often sufficient to support the growth of a variety of plants in the humid and semi-arid zones. Moreover, the capacity of natural vegetation to recover from misuse are stronger than in the case of the arid zones. However, in much of the steep mountainous area, where torrents form easily, the steeper slopes have been denuded by erosion and much of the mountainous land of the region has been eroded down to the rocks.

2.2.2. Forest resources

The areas of natural woodlands, manmade forests, bushlands and rangelands have been under study by FAO where detailed information can be obtained from "The Forest Resources Assessment Reports (FAO, 1993). Forest resource statistics summarized in Table (1) indicate that the total forested area in the Near East is estimated at little over 82 million ha, while the other wooded area is around 190 million ha. The largest forest area in the region is found in the Sudan (Ca. 47 million ha), followed by Somalia and Turkey (Ca. 9 million ha), Iran and Morocco (Ca. 4 million ha), Pakistan (Ca. 2.6 million ha), then Algeria (Ca. 2 million ha) and Afghanistan (with little over 1 million ha). Some countries do not have natural forests such as most of the Gulf States.

2.3. Forest Plantations

Information on plantations in the region is irregular. In 1991, tree plantations in the Near East clearly represent the main means of extending forests and wooded areas and major efforts have been made so far, for example, in the Maghreb countries, Morocco has large eucalypt production plantations (219,400 ha), coniferous (59,400 ha) and dune fixing plantations (247,500 ha); the multi-purpose green belt plantations in Algeria mobilized a vast range of resources covering more than 150,000 ha; by 1990, Tunisia had reforested more than 312,000 ha (including 50,000 ha of forage

afforestation). Cyprus established plantations at an average of 600 ha a year and Turkey 650,000 ha during the 1985-90 period, using species of poplars, willows, eucalypts, alders, cypress and pines.

Table 1: Forestry Resources (in thousands of hectares)

	LAND AREAS (in thousands of hectares)				
COUNTRY	TOTAL	FOREST	OTHER WOODED	TOTAL WOODED	% WOODED
Algeria	238174	2198	2168	4366	1.80
Egypt	99545	52[3]	--	52	0.05
Libya	175954	333	446	779	0.40
Morocco	71500[2]	3557	1161	4718	6.00
Tunisia	15536	424	--	425	2.70
Mauritania	103040	554	195	4534	4.40
Cyprus	924	153	40	193	20.90
Malta	32	--	--	--	--
Turkey	77076	8852	11343	20195	26.20
Iraq	43397	1250	300	1550	3.60
Jordan	9718	71	75	146	1.50
Lebanon	1023	38	45	84	8.20
Syria	18405	190	239	429	2.30
Yemen	52797	10	4050	4060	7.70
Afghanistan	65209	1221	690	1911	3.00
Iran	163600	3793	14250	18043	11.00
Pakistan	77088	2640	1105	3745	4.90
Saudi Arabia	214969	201	1400	1601	0.70
Kuwait	1782	--	--	--	--
U.A.E.	8360	--	--	--	--
Qatar	1100	--	--	--	--
Bahrain	68	--	--	--	--
Oman	21246	--	--	--	--
Sudan	237600	47640	98600	146438	1.10
Somalia	62734	8990	53020	6211	99.00
Djibouti	2198	71	44	115	5.20

Efforts made in Jordan are modest and aim at fixing terraces and improving the environment. Plantations covered 32,000 ha in 1987, whilst 1,000 km of roads had been planted. In Syria, a tree

[2] according to national report;

[3] rows of trees with 1,000 trees per ha;

planting programme averaging 4,000 ha a year, has been underway in the semi-arid zone. The plantation efforts made in Lebanon by the Forestry Department, the Green Plan and other organizations, have been stopped since 1975. Efforts made in this sub-region suffer from natural problems, as well as from discontinuities caused by the unstable situation. Other Middle Eastern countries (Afghanistan, Iran and Pakistan) realize a relatively small area of plantations. Although logging in Afghanistan (around 600,000 m^3/year) largely exceeds the estimated annual capacity of 70,000 m^3, only 260 ha are planted annually. Plantations in Iran are mainly concentrated in the Caspian regions of Zagros and along the Gulf of Oman. Areas covered by 1990 were estimated at 150,000 ha, made up of 24% conifers and 76% broadleaved. Plantations in Pakistan are mainly irrigated broadleaves (*Dalbergia sissoo, Morus alba, Melia azedarach*, poplars, and eucalypts); 251,000 ha of plantations were planted in the 1985-89 period, including 234,000 ha for production and 17,000 ha for environmental protection; the production of seedlings for scattered communities is intense and totals 20 million seedlings per year.

Tree planting in the rest of the Near East region is very weak, in view of the demands for wood and the needs for environmental protection.

2.4. Place of Forestry in Near East Society

An incongruous feature of the status of forestry in society is the remarkable love of the ordinary people for trees, and yet the lack of conservation consciousness. Love for trees and "green" due to the cultural and religious background often approaches reverence. But, it is rather ironic that the few patches of forests which have survived the axe, plough or fire, are considered by many societies as a free gift of God to fell, clear, cultivate, graze or hunt its fauna. Forest conservation is a vague, not fully understood concept, whereas nomadic grazing, speculative cultivation, fuelwood gathering are economic necessities and often vital means for survival.

For the majority of the countries in the region, the most important link between forests and societies is the limited soil and water resource base and the need for its rational utilization and conservation to meet the growing food demand. The potential arable land in the region has been estimated at about 139 million ha. Of this, about 60 percent is actually under cultivation. Projections to the year 2000 show that a maximum of 67 percent of the potential arable land can be brought under cultivation. Most of this additional limited area will have to be irrigated, rather than rainfed arable land. In other words, in the region as a whole, there is very little prospect that increased agricultural production can be achieved by the extension of arable land. Instead, there will be much more dependence on the intensification of production on land already under cultivation, (FAO, 1990b). For forestry, this means a greater contribution towards overcoming climatic and other physical constraints, especially through the cultivation of trees and shrubs to improve the micro-climate and to conserve soil and water resources on which food production depends.

Total livestock population was estimated at some 270 million heads of cattle, sheep, goats, camels and buffaloes (1990); almost all depending on natural vegetation for their daily feed requirements. Some 20 to 30 percent of these requirements are met by arboreal fodder. There is no substitute available in the medium and long term for arboreal fodder and there is no possibility for increasing fodder production without the development and conservation of woody vegetation. Also, since drought is a recurring phenomenon in most areas of the region, trees and shrubs assume even greater importance in the form of "emergency fodder reserves" for livestock, since perennial woody plants are better equipped than annuals to survive during extended droughts.

It may be paradoxical to talk about prospects for biomass production for energy from the Near East forests, where production is already limited by the harsh environmental conditions, especially the long dry summers.

The wood energy issue is, however, of paramount importance to the region, for several reasons:

- most rural people and the low-income urban dwellers in many countries of the region use large amounts of fuelwood and charcoal (e.g. Sudan, Afghanistan, etc.). Where these are lacking, agricultural residues are used for cooking food and heating houses (e.g. Egypt). The economic importance of wood energy is often overlooked because it is consumed locally or, if marketed, it is hardly recorded in government statistics. There are already acute scarcity situations in many mountainous areas and arid parts in the region;

- there are considerable amounts of wood resources in the form of residues or by-products of logging operations, thinning, cleaning of forest floors, etc. which could be mobilized to alleviate energy shortages; (e.g. North Africa, Egypt, Syria, Turkey, Iran);

- large areas of currently marginal lands could be used for combined production of energy and fodder; (e.g. North Africa, Egypt, Sudan, Somalia, Yemen, ...etc.);

- including an energy component in the management of woody vegetation would enhance its value and stimulate investment for its conservation and development.

While the total forest area in the region is relatively low compared to other regions, (65 million ha, 1990) there are several countries with wood resources (natural forest and/or plantations) sufficient to sustain some types of forest industry. There are still other countries with limited forest resources, but their climatic and soil conditions permit the establishment of plantations of fast-growing species. Considering that the 1990 forest products imports to the region represented more than US$ 5.3 billion and that its industrial roundwood production, at present, amounts to some 16,400 m^3, there are good social, economic and financial reasons to justify the creation of appropriate forest industries. This will be essential for a better mobilization of existing resources, whether natural or manmade, and the valorization of the considerable wood supplies standing in the form of roadside plantations, hedges, shelterbelts and windbreaks. It will be possible to generate employment and investment in the sector through management, logging, exploitation of woody resources and establishment of new plantations, (FAO, 1990b).

2.5. Forest Protection and Conservation

Besides uncontrolled cutting, the forests in all the countries of the region are threatened by two major problems: fire and insects. The lack of forest and plantation management in most countries, coupled with the lack of silvicultural practices create circumstances that are favourable to the propagation of fires and diseases. Fires are also favoured by the arid climate and the increasing numbers of visits made by tourists and those living next to the forests.

Forest fires are frequent in North Africa and Turkey, but these are being increasingly well controlled, due to a growing level of vigilance by the forest administrations and the use of more developed management systems.

Damage to forests caused by insects has been signalled in a number of countries. In Morocco, the main predators are the processionary caterpillar (*Lymantria dispar*) and *Phorancanta semi punctata* which require annual treatment over 30,000 ha. These same pests are also worrying Tunisian foresters. Treatments are also necessary in Morocco to avoid oak blight (*Cerambyx hirtus, Platypus cylindricus* and *Hypoxylum mediterraneum*). The processionary caterpillar (*Thaumetopaea wilkinsonii*) also need to be continually controlled, especially in Lebanon and Syria. No such damage has been indicated in Egypt or Libya, but great attention is required around irrigated plantations, lake-sides and urban developments.

Forest formations are also threatened by fire in Near East countries, but the tendency has undergone a clear reduction, (e.g. Turkey). Fire and insects are responsible for a limited amount of damage in Iran, but the forest administration is building up a good stock of fire-fighting equipment. No damage has been reported from Pakistan due to the adequate preventive measures that have been enforced, particularly the creation of firebreaks in sensitive areas. Little information concerning damage caused by insects is available from the Middle East sub-region. Generally speaking, existing forests are more affected by over-cutting and desertification.

The conservation of typical ecosystems, often representations of relict formations which until recently had been more extensive, and the protection of the often attractive fauna of the desert zones (oryx, addax) are among the major objectives of conservation strategies in the region. An increasing effort is being made by a number of countries in the region to create national parks, (FAO, 1990a).

2.6. Forest Industries and Trade

Major forest industries in the region are very limited. Some statistics of the forest products of the Near East are summarized in Table (2).

The forest industries include production and processing of paper pulp and the transformation of wood or other cellulose products (the Maghreb countries, Turkey, Iran and Pakistan) and lumber and panels (the Maghreb countries, Cyprus, Turkey, Afghanistan, Iran and Pakistan). The region's production (1991) averaged 900,000 tons of paper pulp, 47% of which came from Turkey, 18% from Pakistan and 15% from Morocco.

Forest industry development in the region has followed the models of highly capitalized, large-scale production suited to the growing market of industrialized nations. The problem of sustainable supply of raw materials, either from locally grown wood or from that imported, has received little consideration. It is not surprising, therefore, that with a diminishing forest resource in the Near East, the majority of forest industry enterprises are facing an acute shortage of raw material. There is more room for small-scale forest industry plants. This would mean increasing the use of local species in industrial plantations. Furniture and fencing materials and the non-wood forest products such as oils, resins and medicines are perfectly adapted for small-scale industry. They use local resources, do not require imported technical know-how, need little capital and fulfil actual needs (FAO 1990b).

More detailed information on production, imports, exports, consumption of forest products, as well as pulp and paper products, are given in the FAO Yearbook of Forest Products (1991) for each country in the Near East.

2.7. Issues and Conflicts of the Forestry Sector

The problems of forestry development and conservation in the region may be classified into three main groups as summarized by FAO (1990b):

i) biological and technological problems related to forest and tree resources;

Table 2: Some forest products in the Near East region (1988/90)*

	Thousands of cubic meters			Thousands of tons	
COUNTRY	FIREWOOD	LUMBER	PANELS	PULP	PAPER
Algeria	1874	13	50	21	120
Egypt	2161	--	80	80	160
Libya	536	31	--	--	6
Morocco	1364	83	147	113	109
Tunisia	3015	20	97	20	82
Mauritania	--	--	--	--	--
Cyprus	22	57	22	--	--
Malta	--	--	--	--	--
Turkey	9721	4923	781	441	400
Iraq	99	8	3	9	28
Jordan	5	--	--	8	10
Lebanon	482	27	46	--	37
Syria	15	9	27	--	19
Yemen	324	--	--	--	--
Afghanistan	4609	400	1	--	--
Iran	2453	163	54	50	78
Pakistan	22226	751	94	181	151
Saudi Arabia	--	--	--	--	--
Kuwait	--	--	--	--	--
U.A.E.	--	--	--	--	--
Qatar	--	--	--	--	--
Bahrain	--	--	--	--	--
Oman	--	--	--	--	--
Sudan	20682	22827	1.50	--	10
Somalia	7041	7133	0	--	--
Djibouti	--	--	--	--	--

(*): F.A.O. 1992.

ii) technological, economic and managerial problems of forest utilization and trade; and

iii) social, institutional and political problems that need to be addressed in order to increase the contribution of forests and forest industries to development while maintaining the productive capacity of the resource and its role in environmental stability.

There are two main types of technological knowledge which are equally important for the sustainable management of forest resources:

(i) "management" technology, which is concerned with the conservation and sustainable utilization of forests. It includes all the systems and techniques used for the tending of natural vegetation, its regeneration and harvesting, without lowering its productive capacity, it also includes the utilization of the biomass and its transformation into useful products;

(ii) the whole range of technologies concerned with the rehabilitation of degraded lands and their restoration to productive use. They are the technologies for the reversal of forest degradation.

Current levels of techniques for the sustainable development and management of forest resources in the region are insufficient to meet the challenge. This does not stem so much from the lack of knowledge *per se*, but from the fact that research and management systems from industrialized countries have not been adequately tested and replicated in the region for adjustment and adaptation to local needs and conditions. There are many foresters in the region who know more about forest management in the developed world than in their own countries. This is largely due to the fact that most of the available literature and documentation, as well as education and training institutions, are in developed countries.

To exacerbate matters further, inadequate attention has been given to collecting, indexing and disseminating research results and findings obtained by institutions in the region. Thus, the few results obtained from local studies remain buried in archives and are unknown even to local forest practitioners and managers.

Several breakthroughs have been made in the region itself in the field of ecosystem rehabilitation, e.g. sand dune stabilization; the restoration of the carrying capacity of forest range lands through controlled grazing, fertilizer application and/or reseeding; and soil preparation for reforestation and afforestation. But, the high cost of many of these technologies makes their generalized application prohibitive. Sand dune fixation, for instance, may cost between US$3,000 and US$5,000 per ha in some areas. Thus, much research remains to be done to develop new, less expensive, technologies.

In many Near East countries, forestry policies and legislation do not give enough consideration to the participation of local people. Traditionally, professional foresters perform only the role of "protector" of the gazetted forest reserves; and too often, local people are considered as the main enemy of the forest and not as partners in forest management.

A number of important changes are taking place at present in the structure of the societies of the Near East countries which the forestry profession needs to understand and recognize if it is to

adequately fulfil its tasks. In fact, the role of the forester will ultimately be defined by the way the profession responds to the challenge presented by the enormous opportunities for the region's forests to produce more food and fodder, higher incomes and greater employment opportunities through appropriate forest industries, more fuelwood and improvement of environmental stability, (FAO, 1992b).

3) FOREST OWNERSHIP AND ADMINISTRATION

3.1. Ownership and Tenure of Forest Lands

Most of the forests of the region are State-owned. There is, however, considerable diversity among the countries of the region as regards the criteria used for determining forest ownership.

The status of the natural forests in the Near East in general, is rarely well defined. Even where the forests have been delineated e.g. as in Iran, Jordan (and partially in the Sudan), this is contested by the adjacent populations and encroachment for cultivation still occurs. Although forest laws have been promulgated in most countries, these are rarely applied effectively due to the lack of well trained and equipped field staff. Moreover, these laws seldom deal with the control of private forests and grazing lands. For most governments, the importance of the forests is far less than that of agricultural land; clearing is all too readily authorized in an indiscriminate manner.

In North Africa, the natural forests have long been considered as State property by the central authorities of the countries concerned. At the same time, it has traditionally been accepted that the adjacent populations have a right to use the forest to satisfy their own needs and those of their flocks. The concept of "Private Forest" is applied only to plantations, as these constitute a development of the land and according to traditions, land belongs to those who work it. The idea of collective ownership of natural forest is a very recent introduction and does not yet exist in all the countries of the region.

In Jordan, some 87 percent are State owned, 4 percent are private and 9 percent unsettled. Most of Jordanian forest lands are Government forests, either registered in the name of Jordan Government Treasury as Forest Lands or declared as Forest Lands. Both categories are administered by the "Department of Forests And Soil Conservation" (DFSC), in addition to all other government owned areas which are covered, partially or completely, by forest trees such as: Road Department, Government Institutions and Municipalities. These lands are controlled by the Agriculture Law No. 20 of 1973. The ownership matters are regulated through Government Properties Law No. 17 of 1974 and Government Properties Release and Rent Law No. 60 of 1964.

Private forests in Jordan, which are less than 4% of the total declared forest lands, or 7% of the area covered with forest trees, are managed by the Agriculture Law No. 20 of 1973. These forests consist of small scattered parcels, partially or mainly, covered by broadleaved species. Such species are of less wood value, but usable as fuelwood and for charcoal manufacturing.

The private irrigated forest plantations are of small size but of high value for wood production. The main issue of the private natural forests is that the owners consider their forest trees as obstacles that reduce the capability of their land use. They try to remove such trees from their properties. The DFSC acknowledges their ownership and right to use their lands for other agriculture production. The current Law permits them to cut the existing forest trees on their lands, according to a planned period, in order to ensure the replacement of these trees by successful fruit trees after implementing the suitable soil conservation measures.

Collective and State ownership dominates in the Maghreb countries. For example, in Algeria, of the 526,000 ha of plantations created up until 1989, 77% belongs to the State, 16% to cooperatives

and 7% are private. Of the 930,000 ha of forests, maquis and bushland in Tunisia, 75% belongs to the State; the grazing and alpha grasslands belong to the State or to cooperatives.

Cyprus reports 92 percent State-owned and 8 percent private, while 1 percent of State forests are designated as Communal Forests. In Turkey, where the forests were all nationalized in 1945, the transfer of certain denuded forest lands to private individuals cover 20% of the area, while 40% of forests are State owned, and 40% are communal.

State ownership is dominant in the Arabian Peninsula. All forests and grazing lands have been nationalized in Iran since 1963. In Pakistan, 66 percent of the forests are State and 34 percent privately owned.

In Libya, for instance, all natural forests, esparto grassland, any land covered by plants as may be determined by the Secretary of Agriculture, sand dunes stabilized, or to be stabilized, and government plantations are considered to be State-owned under the Forest Law (5/1952). Even private forests, which account for 10 percent of the total plantations, are managed on the basis of guidelines given in the forest law. In Egypt, most trees planted along the edges of fields or as windbreaks are privately owned. The Government owns the trees planted along roads, highways, major irrigation and drainage canals and in local parks.

In many countries, the ownership of certain categories of forest lands remains unresolved and unsettled, such as degraded forests in Jordan and Afghanistan. However, in other countries such as Sudan, Somalia, Iran and Pakistan degraded areas were declared, by legislation, as State-owned lands.

The distribution of forests by ownership varies considerably among the countries of the region. In the past, Afghan forests belonged to various tribes and families, but now all the forests and rangelands belong to government. However, in view of the past rights and privileges, un-availability of manpower, legislation, etc., it has not been possible for the Department of Forests and Range to take full and effective control of all the forest areas. This has serious repercussions on forest protection, management and utilization.

3.2. Rights of Usage and Access to Forest Lands and Products

Irrespective of legal ownership, the rights of usage and servitudes on the forests, vary considerably among the countries of the region. This variation has its origins in the long history of each country. Over the centuries people, in many countries, have had rights to collect fuelwood or hunt forest fauna. In Cyprus, where property, leases and servitudes on land are registered, some 170 village communities in and around the State forests have the legal right to collect fuelwood from the forest free of charge, while in Libya, the law recognizes *ab antiquo* rights for grazing, collection of fuelwood, fruits, leaves, stones and hunting for personal use but not for trade.

The rights of usage in the Sudan are regulated under the Land Acquisition Act of 1930. The non-acquired rights are published in the Government Gazette with details of the persons enjoying such rights. These may include roads, tracks, waterways open to public use, the water places or sources in forest reserves open to public use and the conditions under which use or access is granted. The Forest Act of 1989 provides the conditions under which agroforestry may be practised. The enactment of Sharia Laws in the Sudan in 1983, promoted the principle that "he who makes an idle land productive, is entitled to its ownership". The impact of such laws on land tenure was the encouragement of people to bring more land (mostly forests) under the plough.

Under the Iranian constitution, mountains, forests, rangelands and deserts are the domain of the Islamic Republic. The nomadic populations have access to such lands for grazing as they move between the lowlands and highlands during summer and winter. Tree fodder is also exploited through coppicing and pollarding. Cultivation, fuelwood cutting and charcoal making are also practised but mostly unregulated.

In Turkey, rights of access to, and usage of the forests were expropriated by law in 1945. This resulted in violent reactions in some parts of the country through incendiarism, illegal cutting and grazing and illegal cultivation. During the year 1945/46, it was reported that some 290,000 ha of forest were burned. Subsequent legislation provided for the return of some of the forest lands to the private sector and excluded "maquis" from the category of State forest unless so necessary for conservation purposes. Legislation in 1986 further provided for the conversion of forest lands carrying maquis and scrub vegetation into agricultural land for distribution to villagers.

Afghanistan reports that poverty and scarcity of resources are responsible for the decline of the environment. In their struggle to produce food, people exploit the thin soils, over-graze fragile rangelands, cut down trees and forests and move on when the land is exhausted, not because they are ignorant but merely in order to survive. While all natural forests and rangelands are deemed to be the property of the State, there is no comprehensive legislation and the corresponding basis for the Government Authority concerned to provide protection and management of these resources. The wars in this country have exacerbated this problem substantially. The draft of Forest Act is under Government consideration. The different types of rights are not identified in the proposed draft. In all the fruit bearing forests, such as that of Pistachio and Chalghoza, people's rights for the collection and utilization of fruits are recognized and honoured.

Pakistan forests, whether public or private, are reported to be heavily burdened with rights and concessions recognized by law or by custom and traditions. These rights were recognized at the time of land settlement in the 18th and 19th centuries and are still being exercised by local populations and by agro-pastoral tribes. Legal rights and privileges are duly considered by forest management and reflected in Forest Working Plans.

In Iraq, it is reported that people living near the forests have the right to collect fuelwood, fruit, mushrooms and to graze their animals; while in Somalia, traditional pastoral land is governed by customary tenure arrangements. Since rangeland is a commonly-owned public land, it is accepted that any area therein once enclosed, belongs to those building the enclosure. The Agriculture Land Law 73/1975 declared all the land of the Somali Democratic Republic as the property of the State, irrespective of its use.

It is evident, therefore, from the country reports that forest lands in the region are burdened with several servitudes, duly recognized by law or by custom. These usage rights range from the grazing of livestock, gathering of fuelwood and cutting of timber for personal use to cultivation. Accordingly, forestry policies and forest management plans should recognize the socio-economic history of forest utilization of the region.

In Jordan, the former laws (1927-1951) acknowledged the rights of the surrounding populations in collecting and cutting wood for household construction, for wooden devices used in agricultural practices and grazing. The same laws dealt with the regulation of these rights through the issuance of licences. The present law (No. 20 of 1973) does not recognize such rights openly, but gives the Minister of Agriculture the authority to permit and manage grazing in the Government

Forests. The forests use for recreational purposes are also managed by DFSC who defines such places.

The owners have all the rights, in the case of private forests, to use their lands, except for tree cutting and pruning unless permitted by the Minister according to issued licences. The same conditions are adaptable for the planted plantations and the windbreaks. Licences are issued by the District Agriculture Department for forest utilization, charcoal making, forest products handling, grazing and transportation. Property issues concerning State forest lands including leases, grants or dispositions, in the case of Jordan are handled by the Department of Lands and Surveys.

The rights of local populations have been safeguarded everywhere and forest use is in fact divided between owner and users. Thus, the owner is obliged to authorize activities vital to the users' needs such as collection of dead wood; some cutting of live wood for non-commercial uses; free grazing of flocks of a reasonable size and in the appropriate season (except in recently felled areas, or in young plantations) collection of minor forest products; harvesting of limited amounts of wood by small dealers, for sale; ploughing of bare plots traditionally cultivated. Such practices remained feasible as long as the populations and numbers of livestock concerned had not become too large. By now, however, their numbers have become excessive and the rigid enforcement of law has become essential to preserve the forest for future generations. In particular, it should be made illegal to alienate any part of the State forests and temporary occupation or cultivation of forest land should be strictly regulated to avoid its expansion.

Rights of usage of Near East forests which are ubiquitous, predate the forest laws and are vital for the subsistence of the rural populations concerned. Attempts to restrict these rights, essential for the survival of the forests, are usually not accompanied by the necessary compensatory measures such as: creation of woodlots to provide easily accessible fuelwood, and management of grazing outside the forest to compensate for areas within the forest excluded from grazing. In many cases, there are bureaucratic impediments to the establishment of long term forest policy and long term programmes, and even where they exist, are seldom implemented.

3.3. Legal Status of Ownership

National forest legislation in the region has been influenced by political, historical, social, economic, cultural, and religious factors. Countries and people develop their own legal norms in much the same way as they have their specific language, behaviour and customs. Certain patterns of forest legislation may be discerned in the Near East, suggesting similarities in the philosophy depending upon whether: (i) the country was a former dependency (e.g.: Cyprus, Pakistan, Algeria) or (ii) a former colonial power (e.g.: Italy, France or Britain) was responsible for the enactment of the initial forest legislation, formulation of forest policy, setting up of the national Forestry Administration and training of national foresters.

This historical background is very important in understanding forestry in various countries of the region. The socio-political system (socialism or market economy) and religious influences (e.g.: Sharia Law) have also influenced current national legislation as far as ownership and classification of forest resources are concerned.

Most of the countries which were formerly under British rule, have provisions in their forest legislations for classification of forest lands for management and related purposes. In the Sudan, for example, forests are classified, under the Forest Act of 1989, into three main categories: National

Forest Reserves, Regional Forest Reserves, and Other Forest Reserves (i.e.: communal, private, institutional forests). The Act also designates responsibility for the management of the National Forest Reserves to the National Forest Corporation (NFC). The Regional Administrations of the NFC have responsibility, on behalf of regional authorities, for the management of Regional Forest Reserves. In terms of management objectives, the forests of the Sudan are classified into two main groups: Protective forests and Productive forests.

In Pakistan, forests are classified into two main categories: State-owned and Private. The State forests are further divided on the basis of the legal protection extended to them into:

- Reserved forests (ownership is settled and rights have been expropriated. Small transferred to cantons or municipalities).
- Protected forests (rights not expropriated).
- Resumed lands (lands surrendered by big landlords).
- Enclosed forests (owned by Government but not notified formally).

Meanwhile, the private forests are divided into:

- Guzara forests ("subsistence" forests whose ownership is vested in communities or individuals).
- Communal Forests (sub-category of Guzara forests but essentially owned by the entire village).
- Chos Act Areas (eroding areas endangering public installations. Taken over by the State and after rehabilitation may be returned to their owners).
- Section 38 Areas (private lands placed under the management of the Forest Departments for ten to twenty years under section 38 of the Forest Act 1927).
- Farm forests (linear plantations, windbreaks and rows of trees, not a legal category).

In Cyprus, the Forest Law of 1967 provides for the classification of State forests into two main categories: main State forests and minor State forests.

The Main State Forests are sub-classified, for management purposes, into:

- Permanent Forest Reserves, to be used in-perpetuity for forestry purposes;
- National Forest Parks, to provide amenities and recreation;
- Nature Reserves, to provide complete and permanent protection to the flora and fauna.

On the other hand, the Minor State Forests are sub-classified into:

- Multiple Use Forests which may be leased for uses other than forestry.
- Communal Forests, assigned to village communities for the production of fuelwood or to be used for recreation.
- Municipal Forests, assigned to Municipalities for recreation.
- Nursery Gardens, reserved for the production and of seedlings.
- Grazing Area, assigned to the inhabitants of a village for grazing.

Private forests in Cyprus may be placed under the protection and management of the Forest Department subject to conditions to be mutually agreed upon by the owner and the Director of the Department of Forests.

In North Africa, written forest laws were introduced under colonialism. During the first half of the twentieth century, the various governments tried to reconcile statutory and customary forest law by introducing regulations for the most part based on European models, but modified to take account of conditions in the region. The presumptive State ownership of all forest trees was also instituted, as well as the delimitation and registration of forest lands. These procedures have not yet been concluded and this has certain detrimental results to the condition and evolution of forest lands. But at least forest laws exist in the four countries concerned, regulating the management of, and production from, forest stands. These laws, frequently modified and complemented by detailed regulations for their application, constitute a perfectly adequate legal framework, but only in so far that it is effectively applied.

In practically all of the region's countries there are legal provisions for State intervention in private forestry. In most cases, felling of trees, and possession, transportation and marketing of forest produce are controlled. In some countries, the establishment of a sawmill or wood working plant requires a licence and permits may be necessary for the import/export of forest products.

3.4. Organization of Forestry Administration

Forest protection has been one of the earliest roles of Government in forestry. A "forest guard" or "protection service" has evolved in some countries of the region since ancient times. Gradually, the protective role expanded to include some technical responsibilities for controlling grazing and for collecting taxes, rents, fees and royalties. Today, the main roles of Government and administration in broad terms, are:

i- declaration of lands as forest lands or forest reserves, and the reciprocal power to make grants or dispositions of such lands for purposes other than forestry, i.e., exercise of patronage;

ii- regulation of the protection and flow of goods and services from the forest to society. This reflects the exercise of sovereignty over the national forest resource vested by legislation in the Government; and

iii- a conservation role expressed through the sustained yield concept in forest management, which stresses the paternalistic attitude towards resources justified on grounds of safeguarding the public interest.

The role of Government in development and environmental protection, as related to forestry, have emerged into importance only recently in the Near East region. They underscore the need for forest policies to flag the necessity for the closer integration and harmonization of the protective, productive and social roles of forestry. The main implication of the "development" role of forestry, is that the forest is not the aim and ultimate objective of the forestry development efforts, but a tool contributing to overall social and economic development. In a similar context, perpetuation of forest resources is not the aim and ultimate objective of forest conservation, but rather as means to optimize the contribution of forest resources to environmental balance and stability.

In almost all countries of the Region, responsibility for the role of Government in forestry is assigned to a Ministry which is, in most cases, the Ministry of Agriculture and/or of Natural Resources. Only a few countries reported the existence of a Forestry Commission, State Board of Forestry or National Forestry Committee as responsible for forestry.

In the countries with a federal system of Government, powers are split between the Central Government and State or Provincial Governments. In other countries certain aspects of government's role in forestry are included in the Constitution rather than in legislation.

Responsibility for forestry is sometimes vested on the same department as for Range Management. Often Forestry Administrations have also responsibilities for wildlife and in most former French colonies, forests and water are administered by the same department. No country in the region has a separate Ministry for Forestry.

As stated above, the role, functions and structure of most national forestry administrations in the Near East, reflect the profound influence of the former colonial powers which first introduced forestry policies, legislation and organizational structures in those countries.

The ideas which dominated in the colonial governments in the educational institutions, where the first national forest managers were trained, have influenced and shaped, not only the structure of the public forestry administrations, but also the "culture" and philosophy of the forestry institutions which evolved after independence.

All countries of the Near East region have some form or another of national forestry administration which assumes government responsibility for safeguarding the public interest in forestry. The functions of public forestry administrations vary from one country to another. In collective terms, these functions may be grouped into four areas as follows:

(i) Regulatory and advisory functions: these derive mainly from responsibilities specified in forest legislation to include advising on legislation and actual enforcement of the forest law(s); advising on the formulation of forestry policy and responsibility for its implementation; assisting farmers and communities in establishing tree plantations for the protection of crops, livestock and of human habitations; advising local authorities on other forestry matters and explaining the objectives of forestry policy and programmes; performing functions on behalf of Governments *vis.a.vis* controlling management and utilization of private forests; interacting with other governmental and

non-governmental bodies in areas and sectors of concern to forestry such as land-use, environment, rural development, wildlife, forest industries, forest products, trade and marketing etc.

(ii) Development and production functions: normally these include: sectoral planning; programming, monitoring and evaluation of programmes; coordination with planning and treasury departments, and with local public administration bodies; collection and analysis of statistics; feasibility studies for investments; technological development of forestry practices such as establishment, tending, inventorying, management, harvesting of forest crops; evolving and applying management systems leading to greater efficiency; community forestry, agroforestry; forest fire protection, prevention and suppression; forest grazing and range management; desertification control; wildlife management; national parks and protected areas; urban forestry and forest recreation.

(iii) Forest products processing, marketing and utilization: these functions are either entrusted to public forestry administrations, to parastatal organizations or to the private sector. They may include harvesting, logging and transportation of forest products; industrial processing of wood and marketing of the processed products; advice to the private sector on forest products utilization; production of fuelwood and charcoal or advising the private sector on charcoal making.

(iv) Forest research and education: these functions are normally assigned to Research or Training Institution(s) which may be independent or associated with other research and/or educational institutions of the country. In some countries, however, these functions are performed by specialized divisions or sections within the Forestry Administrations.

In Libya, for example, the Forest, Soil and Range Department is one of nine technical departments of the Ministry of Agriculture, Land Reclamation and Agrarian Reform. This Department is responsible for planning and implementing programmes for the development and management of forest, soil, range and wildlife resources. It also has the responsibility for planning and implementing measures and works for the control of desertification, prevention of soil erosion, and soil classification. The Department is organized into five sections: forestry, range, soils, wildlife and a technical section.

The Jordanian Department of Forests and Soil Conservation (DFSC) is responsible for forestry administration, as one of six technical departments in the Ministry of Agriculture. The Department is responsible to the Minister on matters concerning forests, especially planning, control, monitoring and evaluation of forestry programmes.

It is reported that forestry administration is highly centralized in the Ministry. Most matters are referred to the Department's Director on behalf of the Minister. Fiscal and personnel matters are handled by the respective departments of the Ministry. DFSC is organized into seven Divisions: afforestation and nurseries, planning and studies, forest protection and utilization, rangeland management, forest land and survey, soil survey and classification and administration. Divisions are further subdivided into Branches.

While the Ministry of Agriculture has the responsibility for the formulation of national forestry policy, DFSC cooperates and interacts with other departments in implementing the policy. Among the non-governmental bodies of special relevance to the work of the DFSC, the Royal Society for the Conservation of Nature deserves mentioning, in view of its role in the establishment of Wildlife Reserves and Protected Areas and in promoting public awareness regarding environmental issues.

In the Sudan, overall responsibility for forestry at the political level, lies with the Ministry of Agriculture and Natural Resources. As a result of a Forestry Sector Review carried out in 1986 with World Bank and bilateral donor assistance, the Government established, through legislation in 1989, a National Forests Corporation (NFC) to take over the responsibilities of the former Forestry Administration. The main task of the NFC, which is still answerable to the Minister, is to provide forest goods and services to the people of the Sudan. The NFC is managed by a General Manager, who reports to a Board of Directors. He is assisted by a Senior Deputy General Manager responsible for all field operations and for coordination at headquarters and three Deputy General Managers at headquarters for Administration and Finance, Planning and Technical Support Services.

In Iran, the Forest and Range Organization (FRO) headed by a Deputy Minister of Jehad, is responsible for forestry. FRO is organised into five sections each headed by a Deputy: Forest Affairs, Watershed and Range; Forest Exploitation and Wood Industry; Education; and Planning, Budget and Administration. At the regional level, each province has a provincial administration, whose head is also responsible for natural resources.

In Turkey, the management of almost all forest resources is the responsibility of the State, with delegation to the General Directorate of Forestry (GDF) of the Ministry of Agriculture, Forestry and Rural Affairs. The GDF has responsibility, at the national level for advising on forestry policy, formulation and implementation; legislation; forest protection; sustained yield management; plantation establishment; establishment and management of national parks and forest recreation areas; wildlife management; forestry extension and public relations; training of staff; construction and maintenance of forest infrastructure such as roads and buildings; operation and maintenance of machinery; harvesting and marketing of forest products.

The Forest and Range Department (FRD) of the Ministry of Agriculture and Land Reform of Afghanistan, is responsible for forestry at national, provincial and local levels. The Department has eight General Directorates and 28 provincial Forest and Range Directorates at the regional level. However, all decisions regarding programmes, projects, budgets, inputs and outputs, are formulated and proposed by the FRD. The main decision and policy makers are reported to be the civil servants, while the general public may have free access to the resources but do not participate in the decision making process.

In Pakistan, there is a three-tiered system of administration: federal, provincial and local as forestry is a provincial subject according to the Constitution. The role of the Federal Government is limited to: forest policy; foreign assistance and training; research and education; provincial coordination; import and export. There is an administrative division in the Ministry of Food, Agriculture and Cooperatives, headed by the Inspector-General of Forests (IGF) with the status of a Secretary to the Federal Government for implementing federal functions. The Inspector-General is assisted by two Deputy IGFs, one Assistant IGF, three Section Officers, one Statistical Officer and other related staff. Provincial Governments own and manage forests and exercise legal powers, while at the local level, institutions dealing with forestry include the Capital Development Authority which has a Directorate of Environment to protect existing vegetation, establish new plantations and improve the environment of the Federal Capital Territory. Managerial responsibilities, functions, powers and authorities are well defined for the three tiers. Nevertheless, it is reported that decentralization, though possible, has not been effective.

In Egypt, the main institutions responsible for forestry administration are the Ministry of Agriculture and Land Reclamation at the national level; and the municipalities at the local level, under

the guidance of the provincial Governorates. There is an Under-Secretariat for Forestry in the Ministry of Agriculture and Land Reclamation. Other institutions which provide advise and inputs are the Desert Research Centre; the Timber Tree Research Department of the Horticulture Research Institute; the Forestry and Wood Technology Department of the Faculty of Agriculture, University of Alexandria, and the Desert Development Centre of the American University in Cairo.

The Forestry Department of Iraq is reported to be responsible for forestry administration. It has Divisions in the provinces which are mainly engaged in managing nurseries, and regulating the collection of fuelwood, grazing, and the harvesting forest products from the State forests. The political standing of the Forestry Administration has varied in recent years and has seen several changes in its organizational structure.

In Somalia, the National Range Agency (NRA), a parastatal organization, has responsibility for forestry, but reported to have no professional foresters. It is intended to function as a "Commission" but with emphasis on "range" rather than "forests". The Minister for Livestock, Forests and Range, assisted by a Board, oversees and guides the work of the NRA.

In Cyprus, the Forest Law of 1967 established three tiers or levels of authority and responsibility in respect to forestry matters: (i) the Council of Ministers, under the President of the Republic which is responsible for declaring State forests and for their classification into broad management categories and has power to grant and dispose of forest lands, (ii) the Minister of Agriculture and Natural Resources, who has power to authorize all aspects of a policy nature, and (iii) the Director of the Department of Forests who has authority for daily administration and management of the State forest resources and certain regulatory powers as regards private forests and forest industries. The Department of Forests is a part of the Ministry of Agriculture and Natural Resources. It is headed by a Director who is assisted by four Senior Conservators of Forests, with nine territorial and eight specialized divisions. Although the territorial organizational structure facilitates decentralization, the ultimate responsibility lies with the Headquarters of the Department and goes beyond the Director to the Permanent Secretary and the Minister. Moreover, other Government bodies such as the Planning Bureau, the Treasury, the Council of Ministers, the President's Office, the House of Representatives and its Committees influence forestry policy implementation and decision making.

In Tunisia, laws that regulate forest land management were enacted in 1966. They detail the systems for managing the forests, regulating exploitation, protection of national forests, protection of forest dweller's rights of exploitation, regulation of Alpha grass areas and communal rangeland, as well as marketing forest products and hunting. The laws apply to private and communal forests as well which include:

i) Private forested, or potentially forested land,

ii) Communal alpha grass areas,

iii) Communal and national rangelands, and

iv) Land to be protected against soil and water erosion.

People living at a distance of less than 5 km from the forest have the "right of use" which includes:

i) Utilization of forest range,

ii) Fuelwood gathering (dry wood), and

iii) Harvesting some non-wood forest products.

3.5. Evolving Role of Private Sector and NGO's in Forestry Management and Development

The role of the private sector in formulating forestry policies and in influencing forestry development, in general, or forestry administration in particular, is either minimal or non-existent in the Near East. This results from the laws and regulations initiated by former colonial powers and the financial control of State forestry pursued by present governments. It is further perpetuated by the policies of national forestry administrations stipulating that natural resources of forests, range, and wildlife must be nationalized if their conservation is to be ensured. Many national forestry administrations find the notion of people's participation in the management of natural resources not only threatens their traditional authority, but also conflicts with public interest. As a result of such policies, privately-owned forests account for a very low percent of the total forest area in the region (e.g. less than 10 percent of the total area of forest plantations in Cyprus, Libya, and Jordan). In most countries of the region private forests are in the form of small woodlots or scattered trees in the homestead, or windbreaks and shelterbelts, as in the case of Egypt.

Forestry policies and legislation in many countries of the region discourage the expansion of private investment in forestry. At most, external food aid and subsidized tree seedlings constitute the main incentives and government support to private forestry.

Generally, there are no private forestry associations or cooperatives in the Near East. Agroforestry associations and nature conservation movements have started to be active, but the participation of non-governmental organizations (NGO's) in forestry policy formulation and/or implementation is still very limited compared to North America, Europe and Asia. Nevertheless, private forestry is reported to play an important role in the western part of Libya where most of the irrigated agriculture is practised. Farmers stabilize dunes and establish plantations for wood and fodder production and for protection from wind. Such plantations are very profitable and comparable to cash crops.

A number of Sudanese NGO's have been active in demonstrating the application of several technologies for afforestation and the use of efficient stoves for economizing fuelwood and charcoal. Many of the projects sponsored by NGOs were very successful in terms of social impacts. The National Forestry Corporation organizes quarterly meetings with NGOs and international and bilateral donors to coordinate efforts and projects.

The Sudan reports further that increasing public awareness is a main objective of national forestry policy. An Extension Division has been created within the new National Forestry Corporation to inform the general public of the causes and consequences of deforestation; to encourage the active participation of people in planning, implementing and managing rural forestry programmes; and to create a sense of responsibility for the environment and community interests.

In Iran, the development policy aims at encouraging the private sector, cooperatives and State enterprises to invest in the tourist industry, non-timber products and forest utilization. Although

private forestry is new to the country and its role is not fully recognized, incentives are offered especially to Cooperatives in the form of minimum royalties where exploitation costs are high. Cash subsidies are offered as well as interest free loans for plantation establishment.

There are several NGOs in Turkey with active roles in the implementation of forestry policy. They include: i) Chambers of Forest Engineers; Trade and Industry; and Agriculture; ii) Association of Conservation of Nature; Conservation and Greening of the Environment of Turkey; Conservation of Natural Life; and iii) Foundations of Conservation of Nature; and Environment Problems.

Furthermore, national development plans provide for financial assistance to private forestry. Credit is offered by the Agricultural Bank for private reforestation and technical assistance and free seeds and seedlings are provided together with roads necessary for the protection of plantations and the extraction of wood which are both built by the State. Privately reforested areas are exempted from land taxes for 50 years, but despite all incentives progress has been slow, perhaps due to a high inflation rate which discourages long-term investments.

Afghanistan reported no procedures for private involvement in forestry policy and administration, since all decisions are made by civil servants.

There are large areas of private forests in the mountains of Pakistan but they are traditionally managed by the Forest Department on behalf of their owners. As a result, the owners feel alienated and disinterested, and the protection of private forests is reported to have become a serious problem for the Forest Department. Eventually, Forest Owners Cooperatives were set up in an attempt to encourage the owners of private forests to participate in their management. The Cooperative Federation may borrow funds from Cooperative Banks in order to improve and intensify the management of private forests. Consequently, the harvested volume has increased, the process of sales has become more efficient and returns obtained faster.

Pakistan further reported several schemes and projects with multilateral and/or bilateral assistance to encourage forestry practices on communal and private lands. Public participation is significant in all these schemes, though sponsored and controlled by the Government. Financial incentives and concessions are offered for the development of forest industries by the private sector.

Private forestry, as a business, does not exist in Cyprus and there are no specific monetary and fiscal policies nor schemes for fiscal incentives.

Some Near East countries report the existence of environmental groups or associations taking an interest in forestry in their overall concern for the environment and the conservation of nature. No country in the region, however, reports an effective political lobby in support of forestry. While national governments have overestimated their own capabilities for forest management, they have underestimated the value of traditional management practices and local governance over forest resources. Local communities dependent on forests for many commodities and services are likely to be more sensitive to their protective functions and the wide variety of goods available from them in a sustainable harvest. Moreover, when provincial and national governments have overruled traditional-use of rights to the forests, local communities and individual households have been unable, and less willing, to prevent destructive encroachment of over-exploitation. Conversely, some governments have begun to find that restoring or awarding such rights to local groups induced them to attend to the possibilities of sustainable long-term production from forest resources.

4) MANAGEMENT AND UTILIZATION OF THE RESOURCE BASE

4.1. Management Concepts

There is controversy over the adequacy of available local technologies for the sustainable management of forest resources in the region. It is often argued that political will, funds and commitment are needed to apply rational management, on one hand, and that knowledge is not adequate enough to apply sustainable management on the other.

It would appear from the country reports that the technology available for sustainable development and management of forest resources in the Near East is insufficient to meet the challenge imposed by the problems.

This does not stem from lack of knowledge *per se* but rather from the fact that appropriate research and management systems from the temperate region have not been adequately adopted, adjusted and tested in the Near East. There are many foresters in the region who know more about forest management in the developed world than in their own countries. This is largely due to the fact that many forest managers were educated and trained in Western institutions, or by local trainers who had received training in industrialized countries. Often, inadequate attention has been given to seeking out and building upon the knowledge accumulated by pastoral populations and forest dwellers or to improving upon technologies available in the region.

Life on the mountainous and arid lands of the Near East has been a succession of periods of prosperity and famine, wars, migration and struggle for survival. While traditional systems of land management and agro-silvo-pastoralism have not always been ideal, they deserve to be assessed, improved and adapted to present needs and management systems.

In-spite of the severe problems of forest degradation, the Near East countries as a whole have made some progress in implementing sustainable development and rational forest management systems. This is surprising in a region where forest protection has been the main objective of forestry policies and where conservation concepts, such as the "Hema"[4] system of range management, were developed by pastoral societies long before sustained yield was thought about as a concept in central Europe.

In terms of forest ecosystem rehabilitation, several achievements have been made in the Near East. For instance, sand dune stabilization, restoration of the carrying capacity of rangelands through fertilizer application or reseeding; reduction of water logging and salinity through proper drainage and irrigation; and improving the efficiency of charcoal making and of cooking stoves. But the high costs of many of these technologies make their application prohibitive in many cases. Sand dune fixation, for example, may cost between US$3,000 and US$5,000 per ha in some countries.

The problem appears to be the tendency of many foresters to apply conservation techniques extrapolated mainly from systems developed in temperate regions. There has been limited systematic

[4] Hema: Areas of land, whether range, forest or combination of both, conserved by a tribe as a communal property. It is protected by tribal laws and exploited collectively for the exclusive use of the tribe (or village). Management is entrusted to the elderly or heads of the tribe.

research or testing of these methods in the region to adjust them to the prevailing physical, social, economic and cultural conditions. Furthermore, inadequacy, or even complete absence of involvement of local people in forest management had drastic consequences. Most forestry policies in the region, at present, stipulate that the forests should be managed on a sustained yield basis. For this principle to be achieved in practice, the annual harvesting yield should be equal to the annual growth. Such a theoretical situation does not exist in the Near East. The most practical principle for the region would be to remove forest vegetation, by cutting or grazing, in amounts which would not endanger its ability to regenerate and reproduce in perpetuity.

4.2. Land-Use and Management Systems

In analyzing the relationship between land-use systems and forestry policies, the issues may be grouped into four broad areas as follows:

(a) Conservation of soil and water

Since soil and water are the basic elements for agricultural production, conservation of water and development of irrigation systems receive high priority in most countries of the region. The development of many large and small irrigation projects in the lower areas, creates the need for watershed stabilization and management in upstream watersheds and catchment areas. Forestry has a dominant role to play in this connection.

National forestry policies do, or at least intend to, focus on the protection of existing natural vegetation or reforestation of bare lands in the high catchment areas in order to contribute to the conservation and regulation of water supplies. For example, in Libya, the policy for hilly areas calls for the State to develop tribal land and to carry out soil conservation works, construct roads, and establish the initial windbreaks and shelterbelts, then divide the reclaimed lands into individual farms for integrated forestry, livestock and crop production under a unified land-use system. A percentage of the investment cost is repaid by the beneficiaries on a long term, interest free basis.

In Iran, after the silting of many large reservoirs constructed in recent years, watershed management received greater attention and a special Government Service was established for soil and water conservation in the mountainous areas. Several reforestation and afforestation projects were initiated for watershed protection and it is reported that many of these projects failed because of socio-economic reasons and rural poverty.

Watershed management programmes in Turkey, include reforestation and afforestation, erosion control, range management and establishment of energy plantations. In Afghanistan, the creation of a Watershed Management Service within the Department of Forests has been proposed in order to focus on programmes and projects on watershed stabilization and protection.

In the Himalayan-Karakuram region of Pakistan, the World Food Programme has assisted watershed management projects for the expansion of arboriculture and forestry, where the conservation of water resources is of major concern. The programme included the construction of check dams, contour trenches, silt traps, small dams and rehabilitation of the vegetation.

While a special Department was established in the Iraqi Ministry of Irrigation for watershed improvement through soil and water conservation and sand dune stabilization, in Cyprus, an

integrated rural development project was implemented during 1978-1984 to improve the living standards of the people residing in 49 villages in mountainous areas of the country.

(b) Windbreaks and shelterbelts:

In the lowlands, especially in the irrigated areas, the need to protect crops and livestock from dry winds is generally recognized. Several countries, particularly Egypt, Iraq and Libya, stress the significant role played by windbreaks in crop production. Yields are reported to be markedly higher in fields protected by windbreaks and shelterbelts. Preliminary studies suggest that 1-2 percent of the arable non-irrigated agricultural land should be planted as windbreaks. These proportions of land are probably on the low side and forestry policies should provide for the systematic establishment of windbreaks or the promotion of what has come to be known as "linear forestry".

Egypt's achievements in the establishment of windbreaks and shelterbelts epitomize the important "support" function of forestry to agriculture in the region. A Minister of Agriculture of the country stated that agricultural crops in the newly reclaimed land of Egypt were a "by-product" of woody trees. And this is no exaggeration when one sees the complete and total destruction of germinating crops by dry, sand bearing winds or the drop of flowers and young fruits of citrus and other fruit trees. Without windbreaks, agricultural crops could not survive the damage from the hot desiccating winds carrying considerable loads of sand particles. The newly reclaimed lands of light textured soils west of Alexandria became productive once windbreaks have been established.

The need to protect agricultural crops from wind, especially during the hot dry season, is recognized by all countries in the region, and the establishment of windbreaks and shelterbelts is among the objectives of forestry policies.

(c) Woodlots and scattered trees

Woodlots and trees in the low rainfall areas of the region and clumps of vegetation in watercourses have an important role in soil and water conservation, in the production of significant quantities of timber and fuelwood, and in the provision of animal feed during critical periods of drought. In the drier areas of the Near East scattered trees such as *Faidherbia albida, (Acacia albida)*, add nutrients to the soil and provide protection to grasses and shelter to people and livestock from heat and sand storms. Forestry policies have so far neglected the role of scattered trees in land improvement in the region.

(d) Agroforestry

Integrated farming systems have been practised in most parts of the region for several centuries. Trees in association with crops protect the fields, restore and enrich the soil and diversify production. Agroforestry may alter the marginal character of arable drylands, make rotation cropping possible and supplies fodder and fuelwood. When timber trees bearing edible fruit (e.g.: *Pinus pinea*, Chestnut, Walnut) are combined with crop and livestock, a more stable and diversified production base is ensured, as reported by several countries.

Agroforestry today refers to sustainable management systems that combine food crops, animals, and woody plants on the same units of land, simultaneously or sequentially, and that apply

management practices which are compatible with social and cultural patterns of local population. Agroforestry aims at increasing the overall production by emphasizing multiple use in such a way that pressure on the land is reduced and the risk of ecological degradation is prevented. Forestry policies should provide incentives to farmers to incorporate trees and woodlots of multipurpose species on their farms, or farming systems.

In Libya, windbreaks and shelterbelts are incorporated in land reclamation schemes along with soil conservation measures, prior to land distribution. In Jordan, however, multipurpose tree species are cultivated to provide fodder and wood, and windbreaks are being expanded into irrigated areas. The establishment of a national green belt, extending from north to south of the country, to protect agricultural land from the desert, has been considered. Algeria also reported on the effectiveness of the "Green wall" being established.

In the Sudan, agroforestry has been practised for many years under the traditional gum arabic production system. In the irrigated areas, the need for fuelwood and the production of other non-wood products, such as honey, have generated interest in tree planting along canals and as windbreaks.

The forests of the Zagros mountains region of Iran have a very important role in watershed management and flood control. This protective function of the forest is considered to be more vital than wood production. Farmers in this mountainous region retain some 20 to 100 oak trees per each ha cultivated in order to provide soil protection and shelter to the crops. They are applying, in fact, a traditional form of agroforestry.

The Afghan farmers usually grow mulberry, poplars, eucalypts and fruit trees along the field boundaries and irrigation channels, both for the protection of crops and the production of poles and wood fuel.

In Pakistan, the 7th Five Year (1988-93) Development Plan provides, *inter alia*, for afforestation, watershed management, range management and resource conservation through several measures, including expansion and improved management of irrigated plantations on agricultural lands. Several agroforestry projects have been launched and recent evaluation studies show significant increases in the number of timber trees on irrigated lands.

In Iraq, date palms are commonly used to provide shade and protection to agricultural crops in addition to fruits. Experiments with the creation of "artificial oases", using palm trees, show great promise.

(e) Range management

In the Near East, in general, animals obtain most of their feed requirements from natural rangelands which cover vast areas of the region. Areas of natural forests in North Africa are confined to the wet, northern regions of Morocco, Algeria and Tunisia, yet they contribute significantly to the fodder budget of this region. They contain important fodder reserve which constitutes the principal source of feed for the animals during certain seasons of the year as well as in lean years. In many cases, the animals exert serious damage on the forest depending on their numbers and the status of the ground cover (vegetation). Sometimes, over-grazing reduces regeneration or even prevents it completely.

For example, in Turkey, 17,000 villages with a population of some 9.4 million live inside or in the vicinity of forests with grazing as one of their main activities. In Afghanistan, the population depends heavily on rangelands for its livelihood. Extensive areas have been degraded through over-grazing and uprooting of shrubs and grasses. Along the major migration routes of the nomads, livestock pressures have resulted in desertification of productive areas.

In Iran, some 4.3 million animals are reported to live within forest areas. In the Zagros mountainous area alone, nomadic tribes are estimated to number one million people. Overstocking in this region results in over-grazing and people resort to tree lopping, branch pruning and coppicing at frequent intervals in order to secure supplementary feed.

Three quarters of the total geographical area of Pakistan consists of mountainous plateaux, deserts and uncultivated land of which 58 percent is reported as rangelands. These rangelands provide one third of the total digestible nutrients of 92 million heads of livestock. In the rural areas, domestic animals are rated as the most valuable possession because they provide a reliable source of income, food supplies, wool, hides and skins, and farmyard manure. But, out of a total rangeland area of 51 million ha, only 12 percent is under the control of Provincial Forest Departments, while the remaining area is used as a common property resource. Because of over-grazing, pastures are degraded and depleted and the health of animals is reported to be poor. Rangelands do not receive priority in the national development plan and the situation is not expected to improve in the near future, as given in the country report.

Iraq reports that excessive grazing is contributing to the degradation of forest resources. Forest lands are open to grazing during all seasons and for all kinds of animals with no limitations on numbers. In some parts of the country grazing is so intensive that the palatable perennial plants have almost disappeared. In the lower limits of the steppe region of the country, cultivation has destroyed much of the rangeland. Mechanization of land cultivation and harvesting of cereals in recent years have accelerated the rate of vegetation destruction on the rangelands. Similar situations exist in the Sudan.

While uncontrolled grazing endangers forest vegetation and constitutes one of the main causes of deforestation, controlled or multipurpose use of forest lands is a sound option in many parts of the region. The evergreen oaks of North Africa, the savanna woodlands of Somalia and the Sudan, the maquis, garrigue and batha of the coastal areas of Turkey and the Levant, and the highlands of the Asian part of the region have potentialities for controlled grazing under a mixed "forestry-livestock" system of range management. Livestock production under nomadic systems of grazing is an inseparable component of the Near East land-use systems and national forestry policies need to include provisions for rangeland development and sustainable management.

Grazing has been part of the traditions for thousands of years and as an activity and occupation, has provided and still provides a livelihood for millions of people. It is generally practised separately from crop production, but feed is sometimes obtained from crop residues (e.g. Egypt, Sudan, Morocco, etc.).

Most countries report that forest grazing and range management are a direct concern to forestry. Forest administrations in some countries of the region have responsibility for rangelands and provide for Division/Units responsible for range management under their organizational structures.

4.3. Budget Allocations

A major obstacle to the development of forest resources in the region is the inadequate allocation of resources to the forestry sector in national development plans. This is partly due to the lack of funds for investment in some countries and largely to the contemporary economic approach which sets development priorities in terms of "maximization" of returns on investments. Forests in the region are ill suited for short-term, high profit development outside the irrigated areas, in view of the low productivity of forest lands and the fact that the numerous indirect benefits from forests are not assessed or evaluated in monetary terms in the cost/benefit analysis of forestry investments.

With the exception of only a few countries which reported a high allocation of resources to forestry in terms of the total national budget, most countries of the region reported allocations to forestry to be less than one percent of the total national budget. Scarce capital resources and limited finance for investment create a difficult dilemma for politicians and decision makers giving priority to forestry over the more fertile, irrigable areas in the land-use options available. Low productivity and the long-term nature of forestry investments have tended to discourage the deployment of financial, human and scientific inputs to promote the sustainable development of forest resources.

In Libya, it is reported that budgetary allocations to forestry and range management from 1960 to 1984, were high in terms of the percentage of the total national budget. The country had no Central Forest Service during 1984-89, due to economic difficulties, but a new Forest Range and Soil Department was established in 1989. There was interest and investment in private irrigated plantations during the 1945-65 period because of high returns. Windbreaks and shelterbelts are established by farmers in the irrigated areas of the country. The Government provides free seedlings, interest free loans and tax exemptions to the private investors.

Several forest development projects were included in the Jordanian National Plan (1986-1990), but many of them were not implemented because of financial constraints. It is reported that the budget allocated for forestry activities does not exceed 0.1 percent of the total public budget.

In the Sudan, it is reported that in-spite of the important role of forestry to the country the annual budget allocations to forestry have been less than one percent of the total Government budget. In fact, during the past few years allocations to forestry are reported as amounting to 0.119 percent of the national budget. Calculations of the contribution of forestry to GDP do not take into consideration some 40 million cubic metres of fuelwood gathered by the people nor other forest products, which though considerable, are not recorded. A forestry sector review completed in 1986 with the World Bank and bilateral donor assistance highlighted the importance of the forestry sector to the economy and it is hoped that investment in forestry may reach at least as much as 15 percent of the development budget for agriculture.

The current Five Year National Development Plan of Iran stipulates inventory of natural resources, development of the Caspian forests, improvement of harvesting methods to reduce waste, development of wood-based industries, improved range management, expanded use of mineral fuels to reduce dependency on fuelwood, promotion of the active participation of people in forest development and expanded utilization of non-wood products. Nevertheless, the budgetary allocations for forestry were not reported.

In Turkey, the Five-Year Development Plan (1985-89) provided for survey and demarcation of State forests, improvement of forest protection, increase of afforestation for watershed protection

and road construction in the forests. The budget for forestry in 1987 is reported to have amounted to 4 percent of the total government budget.

In Afghanistan, during 1990-91, allocations to forestry amounted to only 2.06 percent of the budget allocated to agriculture. In Pakistan, forestry receives some 10 percent of the total development budget allocated to the agricultural sector but it is less than 0.5 percent of the national annual budget for development. It was further reported that these allocations were not adequate for the achievement of the development goals set forth in the national conservation strategy.

The economic potentials offered by quick growing species on irrigated lands has received great attention as the increasing demand for forest products and fuelwood in the region will not be satisfied from the natural forests. Turkey, Syria, and Iraq have invested in poplar plantations. The eucalypt plantations in the Gezira Scheme of the Sudan and the 234,000 ha of irrigated plantations in Pakistan and those in North Africa are classic examples of the prospects offered by quick growing species.

4.4. Social Aspects of Management

A vast majority of forest areas are inhabited by populations which neither participate in national development nor are encouraged to do so. Their land-use practices evolved since the time when population demands were more or less in balance with what the forest ecosystems could provide. Unwritten agreements between neighbouring tribes or communities for regulating the use of forest resources had the force of law and the management of the forest was based on conservation principles, through experience, religious teaching and traditions.

The monetized economy, opening of roads and building of communications with urban centres, disruption of traditional customs and growing populations, have upset the balance and created excessive pressures beyond the capacity of forest ecosystems. An integrated society in which customs are replaced by contractual relationships and civic responsibilities are defined, has not yet evolved in the forest regions. The links between town and country have been strengthened and there is less resistance to change. But age-old customs and loyalties persist in the more isolated areas. In many parts of the Near East region, a significant proportion of the rural population is nomadic or semi-nomadic, and the basic unit still is the tribe, where loyalty is strong and elaborate formal relationships prevail. In the settled areas, the basic unit of society is the family which undertakes some of the responsibilities assumed by the State. Nevertheless, there is in the village spirit and loyalty, a potential vehicle for economic development in general, and forest conservation consciousness in particular. Forestry policies need to seriously consider these fundamental elements. It is precisely for these reasons that community forestry deserves more serious consideration in the Near East region.

In Pakistan for example, the provision of employment for the low income groups in remote rural areas constitutes an objective of forestry policy. Another interesting feature of this policy is the concept of "humanitarian forestry". It implies the recognition of the fact that people in the cold mountainous regions are allowed to collect fuelwood for heating and cooking, and use timber for the construction and repair of their houses.

Forestry policies in the Near East, whether in their formal form or as statements of intents, recognize that people in and around forest areas not only have responsibilities to protect and safeguard the forests but also the right to participate and benefit from forestry development and/or conservation.

One of the weaknesses of forestry policies in some other Near East countries is the policing role of Forestry Administrations as regards forest management and the fallacy that people only exploit and destroy forest resources.

4.5. Urban Forestry

In a region such as the Near East with an ever growing urbanization, the role of forests in providing recreation and leisure assumes greater social significance. Forestry policies in some Near East countries have considered the trends in the demand for these social services and attempted to provide them to the urban masses.

In Cyprus, for example, the forestry policy statement recognizes the value of the forests as areas of scenic beauty and amenity and the need to develop recreation areas and expand the tourist industry. Moreover, the Forest Law provides for the classification of State forests into "municipal" or "communal" forests, assigned to municipalities or communities to be used and enjoyed by the citizens for the purpose of their amenity and recreation.

In Turkey, the accelerating trend in urbanization has increased the demands for urban forests and green areas for recreation. Such areas are established under the Forest Law and are classified into three categories: (i) forest camping sites, (ii) picnic sites for a day's visit but with high visitor potential; and (iii) sites for a day's visit but of limited visitor potential for local needs. Altogether over 270 recreation areas are managed by the Forest Administration.

The forestry policy of 1986 in the Sudan, provided for recreation as an essential forestry activity. A part of the forest reserve around large towns is set aside for recreational activities. Rural people are allowed to make use of forest reserves for recreation. Recreation areas inside forest reserves are the responsibility of the Forest Administration.

In Afghanistan, urban recreation areas are the responsibility of municipalities and the establishment of Green belts around Kabul and Zarange cities was pursued with international assistance. The Ministry of Tourism and Culture and the Tourism Development Corporation of Pakistan are engaged in creating infrastructure and other facilities (roads, rest houses, tourist villages, youth hostels, children's parks, wildlife parks, chair lifts, safari parks etc.). These developments are providing economic opportunities for local people and recreational facilities which, apart from their social importance, will reduce dependence on the land and pressures on the forest resources.

4.6. Desertification

During this century, drought cycles of 10-20 years have been recorded in practically all the countries of arid and semi-arid regions. Yet the total cost of drought to human life and health and to crop and animal production is difficult to assess in many North African and Middle Eastern countries, where vital statistics, even if available, are generally unreliable. Nevertheless, the symptoms and consequences of land degradation are recognized and in certain cases have been determined with a reasonable degree of accuracy.

Although drought may exacerbate the problem of land degradation, human activities in terms of over-exploitation and mismanagement of natural resources in vulnerable areas, are the main causes of loss of land productivity.

Extensive areas of productive lands of North African and Middle Eastern countries are subjected to ecological degradation that reduces their productivity. Degradation operates through land-use systems and it results from a combination of (a) the natural fragility of the resource ecosystems in arid, semi-arid and sub-humid territories, and (b) excessive land-use pressures exceeding carrying capacity. Manifestations of land degradation include: deterioration of rangelands; degradation of rainfed croplands; water logging and salinization of irrigated lands; deforestation and destruction of woody vegetation; growth and encroachment of mobile sand bodies and declining availability or quality of water supplies.

The drought caused not only considerable damage to the already fragile environment, but had also serious socio-economic consequences for rural populations. It influenced forestry policies and programmes so as to be oriented to control desertification and expansion of the desert.

Forestry programmes concentrated on such activities as conservation of woody vegetation, artificial reseeding of rangelands, planting of fodder shrubs (e.g. *Atriplex*), water harvesting, protection and controlled grazing through fencing. In terms of institutional measures, laws were enacted for the protection of shrub vegetation against irrational cutting and forest fires.

In Algeria, a solution was sought through the creation of a green belt in the southern part of the country. This green belt, which is over 1000 km long and 10-15 km wide, was intended to arrest the so-called northern advance of the Sahara. At regional level, the desertification problem demonstrated the need for closer cooperation between countries in coordinating national development policies and strategies. For instance, the twelfth session of the FAO Regional Conference for the Near East (Amman, Jordan, 1976), being cognizant of the severe misuse of land and degradation of natural resources in many parts of the region, recommended the establishment of a "Regional Desert Creep and Range Management Institute" for the purpose of providing basic information required to solve the problem. A preparatory mission was carried out in 1976 and proposals were made for the establishment of such a centre.

As a part of the plan of action to combat desertification, UNEP assisted the six North African countries (Algeria, Egypt, Libya, Mauritania, Morocco, and Tunisia) with the initiation in 1979 of a project entitled "Green belt Project of North Africa". In 1982, the Arab League Educational, Cultural and Scientific Organization (ALECSO) took over the responsibility for implementing and funding the project.

Despite a number of successful attempts and measures to control desertification such as control of cultivation on areas receiving less than 200 mm of rainfall, measures of protection, deferred rotational grazing and proper stocking, artificial reseeding and sand dune stabilization, the problem of desertification remains unabated due to unclear land use policies in many countries in the region, lack of communication within and between government agencies, poor extension services, inadequate training and shortage of expertise in important technical skills such as silvo-pastoral management.

Practically all countries which have a desertification problem report that its main causes are speculative cultivation in drylands plagued by periodic droughts; over-grazing; deforestation or destruction of vegetation by cutting trees and fuelwood gathering. Certain forestry policies in the region provide for the prevention and control of desertification.

The Maghreb countries are aware of the serious risks inherent in desertification and have formulated short and long-term national policies and strategies to cope with the problem of dune

encroachment in particular, and desertification in general. The regional Green Belt Project for North Africa provides evidence of the collective endeavour to control desertification. Yet, the impact of this project has not been as expected, due to lack of funds augmented by low political commitments.

In Libya, priority is given to sand dune stabilization, regulation of grazing, control of soil erosion, growing of drought resistant species in arid areas so as to partially control the process of desertification.

In Tunisia, the strategy for the control of desertification gives due consideration to the role of the private sector. Incentives for proper land-use, encouragement of people's participation in dune stabilization and dissemination of information through advise and extension work are relied upon substantially. Meanwhile, the Moroccan strategy aims at integrating institutional, legal and technical measures at the central level with multi-disciplinary and sectoral projects at the local levels, in areas where desertification risks are high and dune encroachment constitutes a problem.

Dune stabilization in Algeria is seen as an urgent priority and is treated as such in the country's land-use and rehabilitation policy. The "Green Belt" programme reflects this policy.

Responsibility for dune stabilization rests with the local forestry administrations in Morocco, Tunisia, and Algeria. In Mauritania, where dune encroachment is the most serious in the Maghreb sub-region, strategy stipulates that all developmental actions at local, regional and country levels should include provision for the prevention of dune movement and the reclamation of already affected areas.

The movement of dunes is one of the most dramatic manifestations of the desertification process, especially in North Africa. Perhaps the most important aspect of dune encroachment is the impact it has on individuals, families and the communities. As more land is covered by dunes, less land remains for food production, thus destroying the farming systems. As the exodus of rural people intensifies, migration may become permanent.

Desertification is of great concern in Jordan though precise data and information are not available. The rangelands which cover some 90 percent of the country are the most affected by desertification. Water and wind erosion are widespread in these areas as a result of the degradation of the vegetation cover. The main constraints to desertification control are reported to be speculative cultivation in arid areas to meet the growing national needs for food; overstocking of rangelands; fluctuations in agricultural production due to erratic rainfall; inadequacy of agricultural policies; lack of legislation and absence of land-use and management policies. The responsibility for desertification control lies with the Ministry of Agriculture (which includes the Department of Forests and Soil Conservation) and other Ministries and Organizations.

The situation reported by Jordan exists also in other countries of the region. In the Sudan, for example, desertification is defined as the "continuous and sustained diminution or destruction of the biological potential of the land in arid and semi-arid environments. It is a result of many contributing factors, exacerbated by drought, but mostly controlled by man and related directly to inappropriate land-use practices". Abuse of land resources may result in low agricultural productivity, shifting dunes, shortage of fuelwood, poor environmental quality (dust storms) and degradation of rangeland. The area affected was found to be some 65 million ha.

A study of desertification in the Sudan in 1973, affected by the catastrophic drought, revealed that the main problem was inappropriate land-use. Solutions were to be sought in proper land-use planning and practising, but forestry was stated to have an important role in this regard. Rehabilitation measures include biological and mechanical due fixation, re-vegetation, and establishment of shelterbelts and windbreaks.

Measures to control desertification in Iran include forest protection, subsidized petroleum products to replace fuelwood, regulation of grazing, conversion of less productive agricultural lands to pastures, extension of sand dune fixation, afforestation of rural areas to provide fuelwood, and information campaigns through mass media, mosques, and schools, in order to increase public awareness about the problems of desertification.

In Afghanistan, despite internal conflicts, desertification is reported to be of great concern to the country. A national committee on desertification was set up in 1977 and steps are being taken to broaden its mandate by establishing a National Committee on the Environment. The strategy for desertification control focuses on: ecologically sound and socially acceptable land use; promotion of soil and water conservation; stabilization of moving sands; creation of public awareness and encouragement of people's participation in large scale plantation programmes; conservation of natural forests; development of private sector agriculture and control of flood irrigation.

Desertification and drifting sands cause substantial damage to life, property and communication systems in Pakistan. A Watershed and Arid Land Development Authority (WALDA) was approved in principle to be established in connection with the Forestry Sector Master Plan. The functions of WALDA would be the evolution of a long-term policy for conserving the country's land, water and forest resources; research in arid land development and support to the provincial agencies dealing with desertification control. In the meantime, several authorities and institutes in the country promote projects and research related to desertification control. Among these are the Pakistan Forest Institute and several of its sub-stations.

Iraq has invested considerable sums of money in dune stabilization to protect irrigation canals and communication systems in particular, while Somalia estimates that over two billion US dollars would be required for initial establishment costs only to restabilize dunes with forest plantations.

The Environmental Protection Plan of Egypt identifies desertification as a most serious problem for development. It stipulated measures to combat desertification, in which afforestation plays a major role.

4.7. Fuelwood and Energy

Although half of the Near East countries (Algeria, Bahrain, Egypt, Iran, Iraq, Kuwait, Libya, Oman, Qatar, Saudi Arabia, Syria, Tunisia, and United Arab Emirates) are net oil exporters, fuelwood remains the most important source of energy for domestic purposes. The consumption of charcoal is also very high, particularly for cooking.

The countries of the region which are not endowed with oil resources are facing a serious energy crisis, especially in the rural sector, leading to a rapid rate of vegetation consumption and corresponding acceleration of the process of desertification.

Most countries include the production, regulation and rationalization of fuelwood in their national forestry policies. In Libya, wood energy was used extensively for domestic purposes and for burning lime in kilns prior to 1970. Today, as a result of State policy and higher incomes, other forms of energy (electricity, gas, kerosene, etc.) are used. Certain quantities of charcoal, however, are still used.

All the North African countries suffer from shortage of fuelwood. Availability in 1980 ranged from 0.21 m^3 (Tunisia, Algeria and Morocco) to 0.06 m^3 per caput per year in Mauritania. Requirements are estimated at 0.4 m^3 in Tunisia, Algeria and Morocco and 0.5 m^3 per caput per year in Mauritania. Controlled fuelwood cutting in Morocco is estimated at 95,000 m^3 annually, while the uncontrolled gathering is estimated at 10 million m^3 annually.

There is a shift towards greater use of butane gas, kerosene, diesel, electric and solar energy in Jordan. Nevertheless, fuelwood and charcoal are reported as being used for cooking, baking and heating, particularly in rural areas. Efforts are being made to improve the process of charcoal making through the use of metal kilns.

In the Sudan, the demand for fuelwood is estimated at some 45 million cubic metres per annum and accounts for over 95 percent of total wood consumption. Fuelwood production is a priority of the national investment policy and the National Forest Corporation is responsible for supplying all large towns with fuelwood and charcoal. The forests provide 82 percent of the energy consumption in the form of fuelwood, charcoal and biomass; the remaining 18 percent being provided by oil and hydro-electricity. Most of the energy is consumed by households (77.8 percent), followed by transport (11 percent) and industry (5.8 percent). The uncontrolled cutting for fuelwood is expected to continue in the Sudan in the foreseeable future, along with the mechanized expansion of land clearance in rainfed areas. They are considered to be the main causes of desertification. If allowed to continue at current rates, the area of natural woodland will be reduced from 94 million ha to about 73 million ha by the year 2000. To remedy the situation, the Government planned to implement a "Forest Resource Conservation Project" with World Bank support. A three pronged strategy is planned: demand mitigation, increase of sustainable supply and more efficient use of existing resources.

The shortage of fuelwood in the countryside is very acute in Iran and people cut and uproot bushes to meet their needs. The Government provides fuelwood free of charge in order to control and regulate its supply. The use of oil and gas is also promoted by special government programmes to replace fuelwood and thus offer greater protection to vegetation.

In Turkey, considerable quantities of wood are used for energy, particularly in the rural areas. Recent policy, however, aims at the reduction of the amount of wood used as fuel for industrial purposes, (e.g. particle-board making). As a result, it is claimed that the consumption of fuelwood was reduced from 74 percent in 1982 to 59 percent of the total wood production in 1985.

It is reported that under prevailing conditions in Afghanistan, the destruction of forest cover is inevitable. Given the location and terrain where forest vegetation exists, it would be unrealistic to envisage the physical protection of forests by legislation and policing action alone. Unless alternative sources of fuel become readily available at reasonable prices, trees and bushes, even roadside trees, cannot be protected. No control is exercised over the trade of wood and fuelwood along the border areas.

In Pakistan, the forest policy of 1989 stresses among its several objectives, the development of fuelwood plantations in areas of wood scarcity, through public motivation and incentives. Seventy percent of the population of Pakistan lives in rural areas and depends entirely on biomass for its domestic energy needs. According to a World Bank estimate, per capita consumption of fuelwood in Pakistan is 0.213 m^3. Consequently, 24.3 million m^3 of fuelwood, (13 million tons) are estimated to be consumed annually in the country.

In Iraq, (a major oil-producing and exporting country) 66 percent of local wood production is used as fuel and the government encourages the use of oil and electricity to save the vegetation. The creation of village forests to provide fuelwood in the arid lands is also being considered.

The one million inhabitants of Somalia's capital city, Mogadishu, are estimated to consume 155,000 tons of charcoal per annum. If current trends continue, this consumption is expected to increase to 350,000 tons by the year 2000, which would be equivalent to one million tons of firewood. Alternative sources of energy such as electricity, gas, kerosene, wind and solar energy, are being considered as possibilities for replacing charcoal. Nonetheless, low income, make electricity, gas and similar forms of energy very expensive and beyond the financial means of most people. A scheme for the possible expansion of kerosene use to replace fuelwood has been studied.

Wood fuel is used for heating homes in Cyprus, both in cities and in mountainous rural areas where wood stoves are used for heating during the cold winter months. Firewood is a luxury fuel in the cities but sells well even if electricity, gas and oil are far cheaper. Charcoal is used for cooking and for barbecues in-spite of its high cost. Wood provides about 0.5 percent of the total energy requirements of the country.

In Egypt, due to lack of natural forests and availability of crop by-products and liquid petroleum products, wood fuel represents only 0.02% of total energy consumption in the rural areas; the rest comes from crop residues, cow-dung and electricity.

4.8. Wood Industries

Despite limited forest resources of commercial significance, the potentials offered by the existing vegetation for viable economic utilization have not been fully explored. Forestry policies include provisions for the production and industrial processing of forest and related raw materials. In some countries there are also provisions, under the overall national industrial development policies, to impose protection and offer incentives to forest industries, particularly the small-scale processing units in rural forest areas.

The production, harvesting, processing and marketing of wood products in the Near East has been going on for centuries. Shipbuilding was an important consumer of wood in early times. Many cedar trees were cut from the Atlas and Taurus mountains and from Lebanon to provide the wood for temples and palaces, furniture and coffins of kings and dignitaries. Timber availability was related to power and many wars were fought for the acquisition and possession of forests stocked with timber. Considerable quantities of wood were used as fuel for the melting of copper and iron ores, burning lime, and for firing bricks, clay tiles and millions of clay pots and household utensils.

Continuous exploitation of forest resources over the centuries has created a certain contempt among certain circles in the region for anything connected with the harvesting and processing of forest trees. Wood processing and marketing has connotations of "environment degradation" unless, it is

practised or controlled by the State. Notwithstanding the fact that exploitation of the forest resources of the region has been going on from the early days, without the application of sustained yield concepts or reforestation to renew supplies, the production of industrial wood continues to play an important role in the economies of some countries in the region.

In Libya, little progress is reported towards the realization of the potentials offered by the wood industry. Many of the man-made forests of the country are ready for harvesting but are allowed to continue growing. It is reported that the country was producing in 1981 some 626,000 m^3 of wood per year of which 536,000 m^3 were used as firewood. These are sizeable quantities of forest raw material which justify investment studies in forest industries. The country is reported to import considerable quantities of round and sawn timber, particleboard, wood-based panels and plywood and paper products.

Forest harvesting in Jordan's State forests is restricted to the felling of dead and defective trees or the clearing of fire breaks, while the majority of industrial wood production comes from private forests. Forest industries are limited and consist of small carpentry shops and box or wood container making for fruit and vegetables. Match factories and furniture industries depend on imported raw material. An industrial complex established in 1970 in the gulf of Aqaba, based on imported raw material, operated for 6-7 years before going bankrupt. Since processing plants depend on imported wood, they are located in cities or coastal areas and their contribution to the economy of forest regions is minimal. Jordan has no special trade policy concerning wood products, as it is an open market and there are no controls regarding imports/exports. Local marketing is also free and prices rely on supply and demand situations.

In Sudan, it is reported that most sawmills are State-owned and generally date back to the colonial time. Logging is organized for the mills by their managers through contractors or departmental labour, but harvesting losses are substantial and the wood industry in the south of the country is hampered by security problems. The Government plans to rehabilitate the sawmill industry whose total capacity in 1990 was estimated at 47,000 m^3 and is expected to reach 195,000 m^3 by the year 2000. It is reported that investments will be made to develop the plywood industry using locally produced logs. The bent-wood chairs and particleboard factories use *Eucalyptus* wood and other raw material from *Balanites aegyptiaca* and *Boswellia papyrifora*. Other small local industries include artisan production of boats, saddles, carts, oil presses, water wheels, etc. The marketing policy for sawn timber is set by the Government which also controls most of the wood industry.

The policy of Iran is reported to aim at the minimization of wood waste during harvesting and processing, while in Iraq, limited harvesting takes place in the natural forest in the north of the country apart from individual tree fellings in the irrigated areas. One pulp mill based on marsh reeds is reported in the Bassorah Governorate and a rayon industry based on *Eucalyptus* is under consideration. Four match factories are reported operating on imported poplar raw materials.

In Turkey, the forestry policy aims at meeting a greater share of the industrial wood and fuelwood needs of the country from local sources. Harvesting, transporting, processing and marketing of forest products are carried out by State enterprises. The national wood industry includes: (i) primary forest industries of sawmills, panels and boards and secondary wood industries for parquet floors, furniture, doors and window components for prefabricated houses; and (ii) other forest products, such as pencils, musical instruments, wooden toys etc.

A survey in 1981 revealed the existence of 7,960 private sawmills handling some 10.6 million m^3 of wood annually and 27 State-owned plants with a total annual capacity of 1.08 million m^3. In addition, the country had 33 veneer plants, 20 plywood factories and 24 particleboard plants with an annual capacity of almost 1.5 million m^3. Nearly all of the raw material needs of the wood industry are locally produced. The proportion of industrial wood to fuelwood increased from 28 percent in 1982 to 41 percent in 1985 and the policy is to further increase the industrial use of fuelwood. The wood industry of Turkey makes an important contribution to the rural economy. The value of industrial production is reported to have been over 1,300 billion LTS and to have occupied the fifth position among the 34 most important production sectors of the economy in 1986.

In Afghanistan, thousands of cubic meters of logs illegally extracted from mountain forests and large quantities of reeds have been reported to leave the country. Studies revealed that harvesting and processing losses are as high as 50 to 70 percent, especially in squaring logs. On the average, 18 months elapse between felling and sawing. There are sawmills owned and operated by the Government in some parts of the country, and only a few small band mills are privately owned. Little, if anything, is being done to develop and rationalize the wood industry in the country. A Wood Industry Corporation established in 1974 is reported to have failed and focused, on timber trading instead. Eventually it closed down and wood trading is now in the hands of the private sector.

Harvesting operations in Pakistan, are allowed under management plans only in the forests classified as productive and guidelines for harvesting vary from one area to another. Prior to 1980, harvesting was mainly carried out by forest contractors or "lessees". This practice was discontinued and harvesting is now done by a forest development corporation in North West Frontier Province, and a logging and sawmill corporation in Azad, Kashmir. The flow of timber from the forests to the market is reported to be considerable and logging and related waste is high. Wood industry ranks high in the national development priorities. Although forest resources are limited, the wood industry of Pakistan constitutes 2 percent of the total industrial base of the country (1990). It is reported that, among the primary industries, there are 1016 sawmills; 16 particleboard plants based on waste wood, mainly of mango and poplar, and bagasse; 5 hardboard factories; 17 plywood factories; and 34 mills for pulp and paper manufacturing based on agricultural wastes. Among the secondary forest industries, 1664 furniture plants are reported in 12 cities in four provinces. The country also has 12 match factories using 163,770 tons of poplar wood; 90 percent of which is cultivated on farmlands in the Districts of Peshawar and Mardan, which illustrates the economic significance of fast growing timber trees in irrigated areas.

The sports goods industry is an interesting aspect of the wood industry in Pakistan. Of the 306 units manufacturing sports goods, 110 are using wood as the basic raw material. Forty-two firms produce quality goods and 80-90 percent of their production is exported. The sports goods industry consumes about 41,000 m^3 of wood per annum, mainly of poplar, mulberry and willow species. It is also reported that 297 units were identified by a survey in 1989 to be engaged in truck, bus, tractor trolley and boat building. The mines and railways in Pakistan are also important consumers of timber. The mines consume over 200,000 m^3 of wood per annum and railways require some 20,000 m^3 of round wood (mainly *Cedrus deodara*).

Weak interaction was reported between forest management and wood industries in Pakistan, as their relationships were based on middlemen. State-controlled wood industry is reported not to be well organized. Incentives provided to the private sector for the promotion of industry, in general, are also extended to forest industries.

There is no specific policy in Pakistan for timber trading because of the limited availability of locally produced forest products in relation to total national consumption. Wood and wood products are on the "free list" for imports and control is imposed through tariffs. Exports, on the other hand, are controlled and prohibited for some commodities such as firewood and charcoal, wooden boxes, unfinished hockey sticks, etc.

In Egypt, there are no natural forests, yet the country reports the existence of some 20 million trees growing in the form of windbreaks, 12.5 million trees along irrigation and drainage canals and 14 million trees for the protection of highways (1990). Species of *Eucalyptus* and *Casuarina* provide raw material for the production of particleboard, veneers and matches. The raw material is supplemented with agricultural by-products, bagasse and imported logs. One public corporation, the "Wood Trade Corporation", used to have monopoly of all imports, but the private sector has recently been allowed to import timber. Prices of wood products are reported to have increased threefold during the last five years (1985-1990) because of the growing demand and rising international prices.

In Cyprus, over 90 percent of the volume of industrial wood is coniferous, mainly *Pinus brutia*, which has excellent qualities for pulping, particleboard making, the manufacture of furniture and as structural timbers. Trees are sold standing and the logging, hauling, transportation to mill gate is carried out by private contractors. Up until 1974, the wood industry consisted only of sawmills, but over 50 small and 4 large mills existed in 1990. The Cyprus Forest Industries Ltd., a public company with 51 percent of the shares owned by the Government, was established in 1970. The company started operations in 1974 with an automated sawmill, kiln drying, and a particleboard factory. A privately owned plywood mill, based on imported logs, was also bought by this company which absorbs about half of the annual cut from the State forests. The Cyprus Forest Industries Company also recycles much wood waste from small sawmills and cabinet makers. Grading and standardization controls have been introduced and improvements have also been made by the small private sawmill establishments in the production of packing boxes and construction timber. Conversion waste has been reduced to the minimum, both in forest logging and conversion at the mills. Cyprus produces about 20 percent of its needs in forest products. The volume of imports is reported to be some 300,000 m^3 of roundwood equivalent, representing a C.I.F. value of some US$93 million (1990). The importation of wood products is licensed, in order to ensure that local products are used where available.

Apart from the manufacture of primary forest products, several small-scale operations such as turning, carving, inlaid wood, souvenirs and other items such as baskets, trays, etc., made from reeds and palm leaves are reported by several countries in the Near East.

4.9. Non-Wood Forest Products

The rural people of the region have developed, over the centuries, the ability to live off the resources of the land and to make full use of its products. Throughout the region, forest products other than wood are being used for a variety of purposes. While gum arabic, cork, tannin and resin are used in industry and enter the market economy, a large number of other products are consumed at home or fed to animals and do not enter into national statistics. Such products include wild meat and fish, edible mushrooms, honey and bee wax, nuts, seeds, fruits, shoots, leaves, roots and tubers, aromatic plants used for making beverages and spicing food, pharmaceuticals, fibres and leaves for weaving baskets, trays and roof thatching and fencing.

These products are closely tied to the livelihood systems of the rural communities. The collection and primary processing of non-wood forest products provide employment opportunities and cash income which, though small, may be critical to the household economy. Moreover, the bulk of the employment is seasonal, thus, fits in well with the agricultural cycles and may employ young and old people and sometimes the partially disabled and handicapped.

Throughout the Near East region, products derived from trees, shrubs, bushes, and the forest floor are being used for a variety of purposes. While commercial products such as gum arabic, cork, tannin, and resin have received some attention, a large number of other products used for human and animal consumption are largely ignored by management practices.

The national forestry policy of Libya recognizes the role of non-wood products such as honey from bees, aromatic and medicinal plants in the rural economy. The esparto grass was an important source of income in the rural areas of Jabel Nafusa, but wood pulp has made its collection uneconomic. Libya also reports livestock production through forest grazing as a non-wood product and States that there are some 1,123,000 sheep and goats and nearly 38,000 heads of cattle in four municipalities in Jabel-El-Akhdar. Beekeeping is considered as a profitable activity in natural forest areas. Some 25,000 beehives are moved into forest areas for part of the year. The income from beekeeping is estimated at US$4 million per annum (1990). Other non-wood products of some importance are juniper seeds, salvia leaves, carobs and aromatic products such as thyme, rosemarinus, artemisia and others.

In Jordan, significant quantities of non-wood products were reported to be consumed by households but remain unrecorded. Such products include fruits, leaves and seeds (stone pine seeds, carob, sumach, palmut for fodder, zyziphus etc.); esparto grass, stanchion, reeds, oleander sticks and humus and bark etc. for agriculture. Plantations of *Pinus pinea* have been established to produce seeds.

Afghanistan reports that the main non-wood products of the forests are pistachia, almond, sanject and medicinal plants such as *Ferrula asafoatida, Cumin, Zyziphus vulgaris,* and *Glyserhiza glaberd* and that nuts and medicinal plants are exported.

Sudan produces about 85 percent of the world's supply of gum arabic from *Acacia senegal* and *A. seyal*. Gum arabic has been an item of trade for over 2,000 years. It is the most important non-wood product in the Sudan and the second (after cotton) best foreign exchange earner of the country. Sales from the Sudan are reported to have increased to 57,000 tons in 1985, but declined eventually. Gum tapping provides employment during the summer months when no other work is available for the farmers. Other non-wood products include fruits and shoots, medicinal plants, fibres, and tannin extracts.

In Somalia, frankincense and myrrh are important income earners from forest vegetation, but so is grazing and browsing by some 42 million heads of livestock and a considerable number of wildlife. Other outputs of the forests such as nuts, leaves, and fruits are not traded, thus they do not enter in national accounts. In South-Western Morocco, *Argania spinosa* produces significant amounts of argan oil, in addition to fodder and fuelwood. Morocco, Algeria and Tunisia produce 25 percent of the world's production of cork.

In the past, Turkey used to provide 30 percent of the world tannin requirements from *Quercus velani* and in Western Anatolia extraction and processing of tannin, used to contribute some 80 percent of farmer's earnings.

4.10. Nature Conservation

Only a few forest ecosystems in the mountainous zones and in the arid and semi-arid areas of the Near East have survived and retained their natural state. The forestry, or environmental policies of several countries in the region, provide for the conservation of nature, sustainable management of wildlife, and establishment of protected areas, with special measures for mountainous regions. The policies and measures taken vary considerably among the region's countries but none of them, so far have been fully implemented.

Morocco, Algeria and Tunisia reported designation of natural reserves and enacting laws to protect flora and fauna. A technical committee was set up in Libya in 1990 to study and advise on wildlife management in close cooperation with the wildlife Section of the Department of Forests. The hunting law is reported to need greater political support for its enforcement if the policy of wildlife protection is to be effective. As regards mountainous areas, State policy provides for their integrated development and distribution to farmers.

In Jordan, wildlife reserves are the only form of protected areas. These are the responsibility of the Royal Society for the Conservation of Nature (RSCN), which is a voluntary organization established in 1966, functioning under the umbrella of the Ministry of Agriculture. It has planned the establishment of 12 reserves for the protection of flora and fauna. The objectives of wildlife management, include reintroduction of extinct species, control of hunting and supervision and enforcement of hunting rules and regulations.

As regards wildlife in the Sudan, it is reported that there was a separate Department for Wildlife in the Ministry of Agriculture and Natural Resources which cooperated fully with the other departments of the Ministry. In the early 1980's the Department was moved to the Ministry of the Interior and renamed as the "Wildlife Reservation Forces". This latter body is responsible for the management of three national parks covering a total area of 2,350,000 ha. A fourth national park with an area of 1,250,000 ha is under establishment. Protection of wildlife and regulation of hunting is provided for in the Wild Animals Ordinance of 1936. Mountain forests in the Sudan occupy some 6,000 km^2 in four, separate regions - the Red Sea Hills, the Jebel Marra in Western Sudan, the Imatong and Dongotona mountains and Didinga mountains in East Equatoria in the South. In-spite of the distances, some similarities exist in the common occurrence of certain genera and species.

Responsibility for wildlife in Iran is vested on the Department of Environment under the Office of the President. The main functions of the Wildlife Service is to manage the utilization of wildlife resources, regulate hunting, increase wildlife populations and protect endangered species by establishing protected areas and national parks.

In Turkey, forest conservation is included among the objectives of forestry policy and covered by a legislation, which provides for the protection of nature and the regulation of the establishment, management and use of national parks, nature reserves, scenic areas etc. Responsibility for these functions is vested in the General Directorate of Forests, of the Ministry of Agriculture, Forests and Rural Affairs. There is a Section of National Parks in the General Directorate for Forests which has sub-offices for parks and hunting at conservancy level in the provinces. Protected areas are intended

to provide grounds for the scientific study of the fauna and flora, to protect nature and provide areas for recreation. Turkish wildlife resources, apart from their role in environmental balance, provide a significant share in the protein needs of rural people as well as game and recreation through hunting. Several laws provide for the control and regulation of hunting, the establishment and management of national parks and nature reserves. The protection of wild animals is the responsibility of the Central Hunting Commission, whereas the protection of game areas and the multiplication and reproduction of game species is the responsibility of the Forest Administration. Several Ministries and Government departments and representatives of Hunter Associations, Universities, Travel Agents Union, Ankara and Istanbul Furrier Associations participate as members and observers of the Central Hunting Commission.

Afghanistan reports the declaration of the Bank-e-Amir as a national Park, the Ajar valley as a Wildlife Reserve, Badakshan as a protected area and Kole Hashmat Khan, Ab-e-Estada and Dashti Nawar as Wildlife sanctuaries. The country has several species of wild animals which are of economic importance either for meat, furs or tourist attractions. Many species are considered "endangered" due to the heavy pressure on their habitats or because of excessive hunting. The need for policies to protect wildlife is recognized. Legislation and presidential decrees provide for the establishment and protection of sanctuaries, prohibition of hunting for furs, or hunting of predators, establishment of national parks and protected areas. It is reported, however, that because of the prevailing conditions in the country and the absence of strong national institutions, conservation of wildlife resources is not feasible at this juncture.

Protected areas are reported to be an important component of the overall ecosystem and biodiversity conservation effort in Pakistan. The provincial wildlife organizations in consultation with the National Council for the Conservation of Wildlife (NCCW) have established 10 national parks, 84 wildlife sanctuaries and 76 game reserves, which cover 9 percent of the country's total area. Because protected areas and parks are a new development, the conservation efforts are handicapped by the unavailability of expertise. It is reported that none of the ten national parks is managed under a scientific management plan. The Government has imposed a ban on hunting, netting, capturing and export of all wild mammals, reptiles and native protected birds, their parts, products and derivatives. Wildlife, like forestry, is a provincial matter and provincial governments have separate organizations for wildlife management. At the federal level, coordination is through the National Council for Conservation of Wildlife, with the Inspector-General of Forests as its Secretary.

Pakistan has more than twelve important mountain ranges along its western and northern borders. Many areas along these mountains are in the tribal belt where Federal, Provincial and Local Governments are reported to have little control. The local economy depends on free trade across the borders. The main programmes aimed at the development of the mountainous regions include tourism, watershed management, reforestation and development of infrastructure.

In Egypt, the national policies on conservation and protected area management aim at the control of abuse and destruction of wildlife. Protected areas have been declared in the Sinai, along the Mediterranean coast, several lakes and islands, in the Fayoum and Aswan regions, the Red Sea and the petrified forest at Maadi, near Cairo.

The forestry policy of Cyprus makes specific provisions for the protection of wildlife, fauna and flora. The Forest Law (1967) provides for the declaration of certain parts of the State forests as Nature Reserves or National Forest Parks. The purpose of the former, is to provide protection to the fauna and flora while that of the latter is recreation. An area of 832 ha where the endemics *Cedrus*

brevifolia and *Quercus alnifolia* and the moufflon (*Ovisammon orientalis*) occur, has been declared as a nature reserve. Provision for the establishment of protected areas and of national parks is made under other laws, such as the Game and Wild Birds (Protection and Development) Law, the Town and Country Planning Law, the Antiquities Law, the Foreshore Protection Law and the Fisheries Law. The responsibility for the management of protected areas lies with the authority that declares the area protected.

5) FORESTRY POLICIES IN THE NEAR EAST

5.1. General Principles, Implications and Evaluation of Forestry Policies

The national reports indicated that most of the Near East countries do have National Policy Statements, but there seem to be major differences in what the term "Policy" means and the force or authority that it bears. To some, policy means a declaration of intent or a broad, general statement of overall planning and programming goals. To others it means specific objectives or procedures. Still others use the term to describe legal or regulatory restrictions or functions; (FAO 1990a). Written forestry policies have been in existence in some countries for over a century (e.g. Turkey) or for a few decades (e.g. Cyprus, Morocco, Algeria, Tunisia, Iran, etc.). Some countries (e.g. Pakistan, Sudan) are revising and amending their forestry policies while in others, such policies are of quite recent origin (Kuwait, Saudi Arabia). If policies can be defined as a set of unwritten procedures accepted and followed by a nation on the use and management of forest resources, a few other countries (e.g. Yemen, Oman) may consider that they have a forestry policy; (FAO 1990a).

National forestry policies, initially, consist of a statement of "intentions" or of macro-level objectives and guiding principles in respect of forest resources. The policy statement recognizes the need to conserve and develop forest resources. With the accumulation of experience and the gradual strengthening of the institutions necessary for the implementation of policy, the statement becomes more specific.

Two factors have dominated the formulation of such policies in the Near East; the first is the general aridity of the region and the recognition of the beneficial effects of trees on micro-climates, and the mitigation of water and wind erosion. The second is the scarcity of forest resources due to their over-exploitation in historical times and the current mounting population pressure. This explains the nature of forestry programmes carried out in the region which emphasizes protection, afforestation and forest reservation.

The distinguishing feature which characterizes the role of forestry in the region is the marginality of forest lands for commercial wood production and yet the enormous importance of such lands for the subsistence of millions of people in the region. It is precisely this antithesis in forestry values which typifies the role of forestry in the region and makes it so different from the temperate zones. Forestry in the Near East does not only provide goods and services to people, but in some instances the food security and nutritional well-being of entire rural communities depend heavily on forest resources. Therefore, the anthropocentric approach is the only choice and the pillar upon, and around which, forestry policies in the region need to be based. Forest preservation is a new concept which finds limited support among few individuals, politicians, NGO's, and forestry education and training institutions in the Near East.

5.2. Forestry Policies in the National Development Plans

Forestry is accorded a low priority in national development plans in some countries of the region. Forests are even considered as expendable resources which could be liquidated to feed the development process. Treatment of forest lands at low priorities has accentuated, in many cases, socio-economic disparity within the rural sector itself. Such policies often generate disruptive pressures and have prevented the forest lands of the region and the people living in and around them

from making a greater contribution to, as well as benefiting from, overall economic and social progress.

There have been interesting policy changes in some countries, although in terms of large-scale implementation very little has been done so far. The forestry policy in Cyprus, for example, is closely harmonized with national development policies and provides, *inter alia*, for raising the standard of living in forest villages, the provision of employment creation of rural forest industries, and the provision of fuelwood, public amenity and recreation (FAO, 1990a).

Pakistan provides another example where national development policy and forestry policy are closely related. The six Five-Year Development Plan (1983-88) envisaged the achievement of the following: an annual growth of 6.5 percent in gross domestic product (GDP); 5 percent in agriculture and 9 percent in industrial production. For the forestry sector, these objectives were translated into such targets as: the improvement of watershed areas in order to control soil erosion; siltation of water reservoirs - hence an impact on agricultural production; expansion of the forest area and an increase in productivity of existing forests, so as to contribute to the achievement of the planned objective of a high rate of growth in GDP.

Three of the North African countries of the region (Algeria, Morocco and Tunisia) have oriented their forestry policies in a similar manner to contribute to their national development objectives. This explains the emphasis given in the forestry policy of Morocco to large-scale watershed management programmes so as to contribute to increased water resources as an important strategic element for the country's agricultural production and hydroelectric power generation. This also explains the emphasis given in the forestry policy of Tunisia to the problems of fodder, fuelwood and the diminishing land resources base through large-scale silvo-pastoral management, fodder and fuelwood plantation, and soil and water conservation programmes.

The forestry policy in Turkey is being harmonized with environmental policies and legislation not only at the national level but also within the framework of policy and legislation of the European Economic Community. Traditionally, forestry policy in Turkey has been closely associated with village and rural affairs. Although the functions have recently been separated, there are still close links between the General Directorates of Forests and Rural Affairs.

5.3. Constraints to the Implementation of National Forestry Policies

Management of Near East forests and implementation of national policies, currently face the following constraints, which are also meant to be addressed by the recently formulated Mediterranean Forestry Action Programme (1993).

(a) **physical constraints:** regional and local climatic factors and the resulting characteristics of woody formations and their environment: shortage of water, short growing seasons (given the summer drought), slow soil restoration, difficult natural regeneration of stands, limited biomass production potential, etc.;

(b) **economic, social and cultural constraints:** which vary depending on the sub-region and country and may include:

- the increase in populations totally or partially dependent on forests which preempt any attempt to sustainably manage the forests, unless modifications are introduced in their

activities and ways of life and external additional means are provided free of charge or on a subsidized basis;

- political constraints (often cultural in origin): decision-makers and public opinion underestimate the forests' roles and their importance for socio-economic development and environmental protection; the political will to come to grips with this state of affairs is also lacking; "unconditional" priority given to extensive animal raising especially sheep and goats, in many countries;

- economic and financial constraints (consequence of the above): operating and investment budgets geared to forest conservation and development and forest industry development do not attach sufficient priority to, or allocate adequate economic incentives for, the forestry sector;

- constraints related to the absence of a balanced land-use planning policy: inappropriate approaches and methods in land-use planning and integration of forestry with agriculture and animal husbandry;

- forest laws are incomplete and sometimes incoherent and unenforceable;

- acute shortage of fuel; in fact, fuelwood supplies fail to meet demand in some countries (e.g. Sudan, Somalia);

- the data base on forest resources and products is inadequate;

- commercial constraints, domestic markets and marketing channels for local forest products are inadequate;

- shortage of qualified human resources (at professional, technical and vocational levels) to participate in the sustained development of the forestry sector and forest industries;

- lack of know-how with respect to the functioning and manipulation of forest ecosystems; genetic diversity and the behaviour of native forest species.

5.4. Factors Affecting Forestry Policies

While the majority of the region's countries have enacted laws for the implementation of forestry activities, soil and water conservation, and wildlife management programmes, review of legal provisions shows that in the majority of cases the laws are not enforced. This does not mean that these laws were badly designed, but rather that very little or nothing was done to make them acceptable to the people concerned. At the same time, the resources made available to many forest administrations for operational purposes are extremely limited, so that these forest services can only attempt to maintain the *status quo* of the existing forest resources instead of actively developing them. This has often led to difficulties with rural communities.

Over the years this situation, characterized by administrative repression, has proved to be powerless to contain the ever mounting pressure exerted on the forests by the people living in and near them. Considering the importance of woody resources in the daily life of the people and the

imperative need for their participation in forest management, it is necessary to improve these laws which above all are meant to explain the objectives of the forestry policy. In particular, forestry legislation should be known, understood and followed by the people concerned even if for some of them it could have a negative impact on their activities and resources. To this end a mere publication of the law in an official journal is not enough and mass media should be repeatedly used to enunciate the principle and objectives of the law. The adaptation or adjustment of some laws to socio-economic realities at local or regional levels will provide greater flexibility in the enforcement of the law. In the case of goat grazing, it is possible, instead of total restriction, to adapt the law to each local situation taking into account the possibility of the resources and the real needs of the population.

Some countries (Morocco, Pakistan, Tunisia, Turkey, Sudan) have revised their forestry legislation to enlist greater cooperation of forest communities in forest management. In Morocco, the law enacted in 1976 not only provides for people's participation in the development of the forest economy, but also provides for a return of 80 percent of the forest proceeds to the forest communities in order to raise their standard of living and provide them with supplementary resources to attenuate the social and economic imbalance existing between the forest areas and industrial regions. In Tunisia, such re-orientation meant the provision of compensation in the form of feed/fodder and/or employment whenever the law introduced a restriction in the use of forest land either for regeneration or afforestation purposes.

In other countries (Pakistan, Sudan, Turkey) the re-orientation of forest law introduced the concept of incentives which include granting subsidies, for instance by making seeds, seedlings and fertilizers available at no cost, donating small plots of land, providing technical assistance and granting credit under favourable conditions. Turkey has recently established a forestry fund to encourage private enterprise to engage in nursery production, and communities in forestry activities.

Assistance to farmers through such incentives could help the Near East countries to strengthen their forestry sector and could lead to making better use of the soil with a view to achieving well balanced development.

While such developments are encouraging, their expansion and further improvements are still constrained by several difficulties. Difficulties in changing the land-use system, the time needed for forest management activities to be economic; the forest land tenure problem, as the bulk of the forest domain in the region is not yet delineated and demarcated; the need for more competence than that generally required for the planting of trees and the construction of physical structures for soil and water conservation; and the time needed to inform, organize and motivate the forest communities (FAO, 1990a).

5.5. Administrative Implications

The grouping of management responsibilities for forest, rangelands and wildlands under a single administrative institution is a current practice in the majority of the countries in the region. This type of arrangement is also found in many arid zone countries outside the region and has proved to be effective. However, the structure of these administrations is not strong enough to cope with the amount of activities needed for the sound development of the forestry sector.

The technical efficiency of forestry administrations has to be strengthened in three essential areas: preparation of integrated and multi-disciplinary projects; technical support to forestry field staff; and communication and extension for forest users and farmers.

All forestry activities to be carried out on forest land, or as part of an integrated development project, should be planned with great care. To this end, the forestry administration needs to be staffed, not only with foresters, but also with competent economists and social scientists who will be responsible for the analysis of all the information and measures required for the success of the proposed activities. Local forestry units need technical support in the implementation, supervision and follow-up of integrated forestry programmes. Such support will require a team of specialists, who are aware of recent technological developments and capable of providing guidance to local officers through advice and the establishment of demonstration areas. The forestry administration should also have an extension wing responsible for the preparation and implementation of extension activities. These activities should be linked with action programmes which can be seen to be clearly beneficial to the local people. Only in this way can any attempt to organize grazing, limit livestock numbers, and establish village plantations, etc., succeed.

Several countries in the region have made progress in this regard. For instance, Sudan has recently taken steps which should lead to considerable strengthening of the planning, implementation and monitoring of forestry projects and programmes. Countries, such as Jordan and Cyprus, are also taking steps to improve coordination between the different national agencies of the agricultural sector and this will certainly benefit the development of all sectors. Morocco is reviewing its present forestry organization structure with a view to strengthening the impacts of its forestry programmes. An important departure from the traditional forestry administration in the region is the creation in Sudan of a National Forestry Corporation. Within this organizational concept it is worth while considering the important role that can be played by the private sector in national forestry development, and by the various types of rural organizations, such as cooperatives, regional and national federations of peasants and other forms of collective community organizations which participate or could participate actively in these undertakings.

In the framework of integrated sector development, the forestry administration must also motivate, organize and provide incentives and technical assistance to all initiatives which can contribute to developing forestry activities. The units of the forestry services responsible for training and extension can play a fundamental role in raising the operational efficiency and managerial capability of sawmills and other industrial units, and in improving the productivity of activities carried out by the rural population. The provision of economic and social incentives can be included in this connection with the administration of those tools pertaining to the forestry services. A number of countries are considering the involvement of private organizations in national forestry development. As mentioned earlier, Turkey is moving towards privatization of certain aspects of forestry which will have implications on its administrative procedure, e.g. nursery, production and afforestation. There is also a move towards community management of scrub forests. Tunisia and Morocco are studying possibilities for the creation of forest enterprises for afforestation, wood utilization and non-wood forest products harvesting. In short, the organizational features of the forestry sector should meet the needs of integrating forestry development with socio-economic development. This implies that the activities being carried out by the forestry administration, as well as their structure, objectives and relationships with the rural sector in particular, should be evaluated periodically and adjusted where necessary.

6) RESEARCH, TRAINING AND EXTENSION

6.1. Research Activities

Although the countries of the Near East differ substantially in their ecological, social, economic, and political characteristics, they all suffer from serious land degradation in general and forest depletion in particular. The type, extent and consequences of degradation vary from one country to another but the common cause is the high pressure of human and animal populations exacerbated by harsh environmental conditions. National rehabilitation measures are also different in terms of political commitments, expenditures, social participation and effectiveness.

In order to remedy this situation, many Near East governments have embarked on rehabilitation of degraded forest and establishing new plantations. Most of such activities have not been based on scientific research, nor on well defined research policies. The state of forestry research in the Near East and Mediterranean region was summarized, in an informal consultation of experts convened by FAO in Rome in 1989, as follows:

(i) political commitment to forestry research was lacking in most countries;

(ii) most countries had institutions for forestry research but in the majority of cases these were weak and needed strengthening;

(iii) The "quality" of research was low, especially in terms of methodology and technological innovation;

(iv) communication of research results for application into practice was generally poor;

(v) planning of research programmes, particularly in applied research, require strengthening and support;

(vi) funding of research programmes, with very few exceptions, was inadequate or non-existent; and

(vii) forestry research programmes should be integrated into, and harmonized with, the overall national development plans and programmes at the country level.

Experts from the region argued that, in general, the technology and scientific basis necessary for sustainable development, management and utilization of forest resources is quite low and insufficient to effectively address the forestry issues in both regions. Moreover, three considerations added a sense of urgency to the problem:

(a) In their efforts to produce more forest goods and services, many countries will find it necessary to integrate forestry production into the farming systems. Windbreaks, shelterbelts, scattered woodlots will assume greater significance. But if farmers and rural people are to be involved in such programmes, the advice to be given to them must be based on the results of applied research and studies.

(b) Intensification of management of the surviving natural forests must be based on a better understanding of the functioning of forest ecosystems. Such knowledge is inadequate and research and studies are urgently needed.

(c) Many silvicultural practices and management systems applied in the regions, evolved initially in Europe and North America, and were introduced to the Near East without adequate testing, adaptation or adjustment. This unsatisfactory situation needs to be rectified.

An increasing number of countries in the region now recognize that expanded research would not only reduce costs of forestry investments and make forest management more efficient and productive but will also broaden the basis of local scientific knowledge for forestry education and training. Forest degradation can not be arrested even with massive investment in forestry development unless the remedial measures and management actions to be taken are to be based on the results and findings of applied research carried out in the countries themselves.

In Egypt, forestry research is conducted primarily at the Department of Forestry, Faculty of Agriculture, Alexandria University, and to a lesser extent at the Forestry Section of the Horticulture Research Institute of the Ministry of Agriculture. The Desert Development Centre (DDC) of the American University in Cairo undertakes forestry research pertaining to the role of trees in desert farming systems as well as breeding for salt and drought resistance.

Forestry research is nevertheless not up to the standard expected and is not making use of all resources available. The most important reason for the weak forestry research in Egypt is the lack of a national forestry research plan. Except for a few well-conceived and executed research projects, such as tree breeding and wood utilization, undertaken at Alexandria University and DDC, other research is "*ad hoc*" and does not follow a well-defined theme. There is no coordination or cooperation between research bodies with few exceptions.

Funding of research does not constitute a major constraint. Although the government allocates meagre funds for forestry research, international development assistance agencies fill the gap. As a matter of fact, there is more money available for research than the country can absorb. Most researchers fail to tap this money for lack of professional training in preparation of research proposals.

Research in the future will have to concentrate on forestry as an integral component of farming. As Egypt is expanding its agriculture into the desert, research must be prepared to cope with the demands for trees on the farms for protection, fodder, wood, etc. Most important is the role of trees in the rural economy and their social acceptability. Therefore, desert agroforestry will be the theme for research activities in the next decade.

In the Sudan, forestry research started in the fifties when the die-back of Sunt (*Acacia nilotica*) was investigated. This entomological work was followed by silvicultural research led by one scientist. It was only in the sixties that a full-fledged research programme was started (FAO/Sudan Research and Education Project). This project was terminated in 1968 and since then the programme was maintained by the Sudanese government under the Department of Forests. It was annexed to the Agricultural Research Corporation in 1975, and continued until now.

Forestry research aims at improving forestry practices in such a manner that Sudan's forests contribute maximum benefits to the population, in a sustained and increasing manner. This is done

in conjunction with other agricultural research stations that include a wide spectrum of specialists in all aspects of natural resources. They all work on research for development, i.e. their priorities are within the development plan of the country and a precursor to such a plan.

The main station is at Soba, with substations in the centre, east, west, north and south of the country. In all, there are 24 scientists and forestry supporting staff and technicians (1989).

The main forestry research issues centre round:

- Food security and environmental problems,
- Shortage of fodder for an increasing animal population, and
- Shortage of fuelwood and other wood products for an increasing, mostly rural population.

In Yemen, research programmes on forestry in general and on sand dune fixation, shelterbelts, afforestation of saline-alkaline soils, afforestation of watershed areas, collection and evaluation of few arboreal species is currently being carried out.

Excellent results were obtained in the first half of the 1970's. Based on such results, several kilometres of windbreaks and shelterbelts were established along with roadside plantations. Due to scarcity of finance, a new system of afforestation was employed by giving local people forestry seedlings for planting around their homes, schools and fields. Recently research work for the afforestation of watershed areas with the help of water-spreading systems was also initiated.

In Libya, there is a collaboration between Forest Department and Agriculture Colleges. The main research areas are selection of species suitable for arid areas, introduction of exotics, upgrading of technology for soil and water conservation, afforestation, wildlife, and reduction of costs of forestry operations. The National Agriculture Research Centre deals with forestry research. The forestry research plan is prepared from inputs made by forestry authorities such as the Department of Range, Forests and Soils, the Municipal Forest Services and Agricultural institutes and Colleges. Funds are provided in the budgets of the Agriculture Research Centre, the Ministry of Agriculture and Agrarian Reform and the Agriculture Colleges. The results of research are communicated to the Forestry Administration and the joint Agriculture Extension Service in the municipalities.

Jordan does not have a special institution for forestry research. During 1964-67 species trials and related research was carried out under a UNDP/FAO project. At present, the Department of Forests and Soil Conservation is responsible for forestry research and studies, but inadequate funding does not permit activities in forestry research. The future of forestry research is currently being discussed, particularly as to whether this function should be taken over by the National Centre for Agricultural Research and Technology Transfer or by the Forestry Administration.

In Iran, the Research Institute of Forests and Rangelands (RIFR) (formerly called the Research Institute of Natural Resources) was established in 1968. Its purpose has been to carry out research work on the improvement and utilization of forest vegetation; rangeland and watershed management; erosion control; sand dune fixation; plant protection and pest control and related problems. The Institute is expected to plan, carry out, monitor, assess and evaluate the results of research projects, publish the results, and cooperate with other research and educational institutions

concerned. Its eight divisions cover subject matter areas in: forestry; poplars; pulp and paper; rangelands; plant science; forest products; sand dune fixation; and watershed management.

There are two research institutes under the General Directorate of Forestry in Turkey; the Forestry Research Institute in Ankara and the Poplar and Fast Growing Exotic Forest Trees Research Institute of Izmir. Both cooperate closely with the Turkish Standards Institute, the National Library, the National Productivity Centre, and the Turkish Scientific and Technical Research Organization. The research programmes are determined according to real needs and problems of the forestry practitioners. There is a Research Council which plans the annual research programme in consultation with the Forestry Administration with participation of University Forestry Faculties.

Afghanistan reports the absence of an organization for forestry research. The Forestry Promotion Centre in Kabul, with FAO/UNDP assistance, carries some research related to species introductions such as poplars and *Robinia*.

The research objectives of the forestry sector in Pakistan are, in order of priority; (i) development of management systems for natural forests, including wildlife; (ii) mechanical, biological and engineering systems for soil and water conservation; and (iii) reduction of management costs. The main forestry research institutions include:

(i) The Pakistan Forest Institute established in 1947. Functioning as a Federal organization, it has divisions for forestry research; biological sciences; forest products; forestry education. In addition, there are three directorates which implement research projects in watershed and range management and in silviculture.

(ii) Punjab Forest Research Institute, which concentrates on research in nursery techniques and plantation establishment; species introduction and protection. The Institute also has programmes for the expansion of plantations on private lands and conducts training programmes.

(iii) Pakistan Agriculture Research Council, which is primarily responsible for research in agriculture but carries out studies in forestry, watershed and range management.

(iv) Rangeland Research Institute, established in 1991 with UNDP/FAO assistance.

(v) Provincial Research Units which have been established by the Provincial Forest Departments.

There is intra-sectoral coordination and interaction between federal and provincial institutes, and university departments teaching forestry and related subjects through the Agriculture Research Council. Research results are disseminated through pilot demonstration areas, technical publications and articles in journals, popular articles, and visitors to the institutes.

A forestry research institute was established in Arbil, Iraq in 1954. Several experiments and investigations were initiated but, as reported, recent circumstances and travel restrictions led to the breakdown of many experiments before their completion. Efforts are being made, with multilateral assistance, to revitalize forestry research at Arbil. Currently, other research activities are undertaken by: (i) the Forestry Department of the Mosul University; (ii) the Forestry Research Section of the State Board on Applied Agricultural Research in the Ministry of Agriculture and Irrigation; (iii) the

Implementation Commission of the Industrial Forestry Project, on pulp and paper and silviculture; and (iv) UNDP/FAO project, re-vegetation of degraded lands.

Cyprus reports that forestry research is carried out by the Research Division of the Forestry Department, established in 1954. Funds are provided in the Department's budget and territorial divisions provide the services of their staff to the Research Division for research carried out in their respective forest areas. A long-term Research Plan was prepared in 1958, incorporating three basic principles; (i) establishment of research priorities; (ii) standardization of research procedures and, (iii) continuity of experimentation. The research work carried out by the Forestry Department is largely based on this plan and focuses on species regeneration trials; forest tree improvement and protection from pests and diseases. During the last ten years the work of the research division has centred on the genetic improvement of *Pinus brutia* which is the most economically significant tree of the forests.

6.2. Education and Training

The majority of countries in the region have an insufficient number of forestry personnel at all levels. A manpower survey conducted by FAO in 1988 found at the time that there were 4,580 degree holders in the region and that this number would need to rise to 5,900 by 1995 if established targets were to be met. The number of technicians will have to be increased from 2,620 in 1988 to 3,350 in 1995 and that of vocational staff from 19,710 to 25,330.

In November 1989, an FAO *ad hoc* working group analyzed the results of a 1988 survey. It concluded that the present need is not, as was in the past, to train silviculturists or managers of forest lands, but to produce multi-disciplinary professionals able to grasp all the facets of socio-economic development, especially in rural areas.

Due to the deficiencies in current forestry training, the *ad hoc* group recommended that full consideration should be given to the role of forestry in development. Forestry training institutions should consider this basic fact if they are to ensure the training of the qualified forestry cadre for both the public and private sectors. They are required to provide education which is adequate in the scientific, biological, technical, economic and social fields with due emphasis on management and development of forestry and related natural resources geared to the improvement of the rural economy.

In Libya, the main objectives and orientation of forestry education at the university level are to produce professionals capable of managing state organizations or professionals responsible for rangelands, forests and rural development. The contents of the curricula include management and improvement of natural resources (soil, water, vegetation and wildlife); protection of ecosystems; integration of forestry and rangeland management into a broader strategy for multiple use of natural resources; and extension, communication and public relations to gain public support to forestry. Two institutions are concerned with forestry education: (i) the Department of Range and Forestry of the Agriculture College at Al Fateh University of Tripoli, which was established in 1980-81 and which offers a 4 year course leading to a B.Sc. degree; and (ii) the Omar Mukhtar and Sebha Agriculture Colleges, that offer forestry courses as part of the syllabus in agriculture.

Jordan reports that higher forestry educational institutions do not exist in the country. Professional foresters were trained in universities in Turkey or Iraq. FAO and German aid scholarship possibilities have not been fully utilized to train students abroad because of student admission

difficulties. The Ministry of Higher Education and Jordan Universities have been requested to study the possibilities of including "forestry and range" in their future programmes.

The Sudan Forestry Administration requires four categories of employees: professional, technician, vocational and support staff. Professionals and technicians are expected to have higher and university education in forestry as offered by the Universities of Khartoum and Juba. The Department of Forestry of the Faculty of Agriculture of the University of Khartoum was established in 1975 and a five year course leading to the B.Sc. (Forestry) Honours degree is offered. The college of Natural Resources and Environmental Studies of The University of Juba offers a five year course in forestry.

In Iran, the Faculty of Natural Resources at Karaj University offers courses in forestry and forest economy; wood technology and wood industry; watershed and range management; and wildlife and environment. A similar faculty exists at Gorgan, also offering degrees at the B.Sc. and M.Sc. levels. Three new forestry faculties are reported for training at the B.Sc. level.

In Turkey, the Forestry Faculties of the Universities of Istanbul and Karadeniz offer degrees in forest engineering; forest industry and landscape architecture. Degrees in wood working industry are also offered by the Universities of Gazi and Itacettepe.

In Afghanistan, the need for professional training is met through fellowships overseas. A four year course in agriculture, with specialization in forestry for two years was established in the University of Kabul, Faculty of Agriculture, in 1976.

In Pakistan, degree courses in forestry are offered by the Pakistan Forest Institute, Peshawar, which is affiliated with the University of Peshawar.

In Egypt, formal training in forestry is offered by the Department of Forestry of the Faculty of Agriculture at Alexandria University. Students take two years of basic science and general agriculture, then they specialize in forestry. The same department offers M.Sc. and Ph.D. degrees in Forestry. Some other universities offer degrees in horticulture with brief courses in tree planting and physiology.

In Iraq, the two-year forest ranger course at Abu-Graib, which started in 1957, was subsequently expanded to three years and the Diploma granted is considered equivalent to a University degree. This Diploma Course was transferred to the Department of Forestry of the Mosul University in 1964. The course was changed to two years in general agriculture science followed by two years specialized instruction in forestry. M.Sc. degrees in forest science have been also granted since 1974. Several students from Arab countries take their degrees at Mosul.

Technical and vocational training in general, has not yet enjoyed a good status in the society in many parts of the region. Low wages and lack of opportunities for the technician still prevail. Until recently, any technical training involving manual work and development of practical skills was regarded as an undesirable type of education.

Few foresters or professional technicians are prepared to work outside city offices or beyond the boundaries of a forest nursery or public parks.

Technical and vocational training in forestry is a relatively recent development in the Near East region. In Libya, the Hashian Secondary Institute for Forestry and Range Management gives courses in forestry and range management. The duration of the course is 3 years and the institute has a capacity of 300-400 students. The Ghiran-Awelia (Misurata) and Agelat Secondary Agriculture Institutes also include forestry in their syllabus. The Hashian Forest Training Centre was established in 1955 to train at the forest guard level. The course is for one year. These technicians supervise afforestation and sand dune fixation projects. Because of the availability of foresters with higher training and inadequate employment opportunities, the Hashian Centre suspended its courses from 1981 to 1988. Since 1989, a new upgraded course for one year started again, using the facilities of the Hashian Secondary Institute.

The thirteen municipalities in Libya organize short courses in forestry and range management or in nursery practice. Forestry has been introduced as a subject in all public schools as part of agriculture education.

Jordan trains its forestry technicians at the Arab Forestry and Range Institute in Latakia, Syria or at the Cyprus Forestry College.

Sudan offers technical training at two institutions: the Department of Forestry Technicians, at Soba, near Khartoum; and the Forestry Department of the Institute of Agriculture, at Yambio, in the Equatoria Region. The Soba institution had been originally established as a Forest Rangers School in 1946 to offer a two-year course in forestry and was upgraded to college status in 1960. It now offers a three year course leading to a Diploma. Graduates may continue their studies in the Department of Technical Education at the Polytechnic for the B.Sc. (Education) degree and find employment as extension workers and teachers in agriculture secondary schools.

In Iran, technical and vocational training is provided by the Bureau of Education at the Forest and Range Organization. Forestry has been introduced into the general education system of the country.

In Turkey, five training centres (in Trabzon, Eskisehir, Elazig, Kahramanmaras, Kastamonu-Aras) are managed by the General Directorate of Forestry. The courses are of one year duration.

In Afghanistan, a Forest Rangers School, offering a two-year course, was established in 1973 at Paghman, near Kabul. The annual enrolment is 15-25 Agricultural High School graduates. The school was under the control of the Forestry Department until 1976 when it was placed under the jurisdiction of the Ministry of Education and was moved to Kabul. It now forms part of the Agriculture Higher Studies Institute. It is reported that this Institute is unable to function effectively due to lack of qualified instructors, teaching materials and equipment. It needs support and strengthening. Efforts have been initiated through a UNDP/FAO project to introduce environmental/forestry subjects into the curricula of primary and secondary schools and of teachers training institutes.

In Pakistan, the training of technical staff and of forest guards is conducted by the Provincial Forestry Departments. Five schools (Thai, Bahawalpur, Ghoragali, Muzaffarabad and Hyderabad) offer courses.

The Cyprus Forest College was established in 1951 to provide a two year Diploma course. Recruits must have 12 years of primary and secondary education as well as a minimum of nine months practical training in the forest. The training is a combination of approximately 50 percent practical work and 50 percent theory and includes project preparation. The language of instruction is English and the course is open to students from other countries. For overseas students, the College also offers a six month post-diploma course on successful completion of which a Higher Diploma in Forestry is awarded.

Vocational training is not organized on a permanent basis but short courses are given as required. Forestry, as a subject, has not been introduced into the general education system but is very likely to be introduced as part of environmental subjects. The private sector is not formally involved in forestry education but employees of forest industries are trained by the industry and *ad hoc* training in felling, extraction, loading and transport is arranged by importers/manufacturers of equipment.

University and vocational levels of forestry education are also provided in Morocco, Algeria and Tunisia. The Forest Rangers Institute at Latakia, Syria also provide training for forestry technicians in all Arab countries.

6.3. Extension

Extension activities are reported to be weak in the Near East. Only a few countries reported special forestry extension activities and the majority of them consider extension as the responsibility of agriculture departments and/or environmental awareness programmes.

Forestry extension in Libya, is carried out by the agriculture extension services. Special programmes are implemented during the tree planting season when meetings are organized in rural areas. Campaigns through the mass media - radio, television - and the distribution of leaflets, posters and pamphlets.

In Jordan, agricultural extension is one of the main tasks of the Ministry of Agriculture. Forestry extension, however, is the responsibility of the Forestry Administration and much remains to be done to integrate it fully into the programmes and activities of the agricultural extension services, particularly the work of the Agriculture Division of Radio and Television Establishment and other mass media and information facilities. The objectives of forestry extension and information is to increase public awareness of the importance of forestry and the need for the rational use of renewable natural resources in order to avoid environmental degradation, particularly desertification. The main means used for forestry extension are: (i) arbour day celebrations, under the patronage of His Majesty the King; forest seedlings and technical advice are offered free of charge for these celebrations; (ii) radio and television programmes; (iii) lectures and seminars for schools; (iv) the national afforestation project which started in 1989 in order to coordinate the efforts of all agencies in afforestation; (v) video cassettes on forestry were produced for use by schools, societies and clubs.

Sudan had no forestry extension service but the forestry policy of 1986 provides for the creation of a strong extension service to create public awareness of the important role of forests to the welfare of the people. A national extension programme has been compiled on the basis of inputs from regional programmes. This programme, approved by the National Forests Corporation, is implemented by regional forestry extension officers, assisted by extension agents in the provinces. Several NGO's assist the Forestry Administration of the Sudan in the implementation of forestry extension projects.

Results of forestry research in Egypt, are published and made available to those interested, through the Extension Service of the Ministry of Agriculture. The report of Egypt stresses the need for strengthening extension services in forestry in view of the growing importance of windbreaks and shelterbelts in the expansion of agriculture. Campaigns for creating public awareness and informing the general public on the problems of desertification and environmental issues in general, have increased recently through radio and TV programmes.

The main characteristics of the Cyprus national forestry extension programme are: (i) clear definition of the subject or message to be conveyed; (ii) specific identification of the target groups to be addressed; (iii) adequate planning before initiation; and (iv) selection of the most suitable means or method for passing the message to the target groups.

The responsibility for implementing the extension programme rests upon all members of the staff of the Department of Forestry. However, other institutions like the Government Press and Information Office, the Cyprus Broadcasting Corporation; the general press; schools, youth groups, NGOs and the Extension Service of the Department of Agriculture, play important roles in forestry extension. Perhaps the most significant role has been played by the Cyprus Forestry Association, established in 1920. Yet, there are no mechanisms through which the public could participate in forestry policy formulation or decision making except through the indirect way of political party lobbies and the House of Representatives.

6.4. Constraints to Forestry Research, Training and Extension in the Near East Region

Forestry research, training and extension in the Near East suffer from several multi-dimensional constraints; some are common to most developing countries, while others are particular to the region. These constraints were identified in terms of four interrelated categories: i) Information, ii) Human Resources, iii) Institutions, and iv) Financial Resources (El Lakany, 1993).

i) Information

The foundation upon which research is based is information. It is needed for problem identification as much as for data analysis and interpretation of the results. On reviewing some of the forestry research, training and extension projects in the Near East, one often notes unnecessary duplication, complicated research procedures and/or misinterpretation of the results; mainly due to the lack of up-to-date information.

The availability of information is becoming increasingly less problematic due to the recent revolution in communications. The majority of forest research institutes of the Near East have worldwide access to written and electronically transferred information. Nonetheless, the benefit of such voluminous information is curtailed in many forestry departments due to one or more of the following reasons: (a) results or experiences are drawn from countries or situations with little relevance to the Near East, (b) researchers are unable to make full use of or to communicate the information due to language problems, inability to use modern devices, or deficiency of his (or her) background information, and (c) information is compiled centrally and not circulated to field stations, nor extended to farmers. Another deficiency in several institutions in the Near East is the reluctance to document and publish the results of local research. This is due to lack of funds and venues, change of personnel, or the inability of some researchers to write research papers.

ii) Human Resources

Several of the Near East countries are blessed with large numbers of forestry researchers and trainers, while others suffer from the shortage of technical personnel. In all cases, however, there is always a need for more researchers. But mere availability of forestry researchers and extension agents is not sufficient, as their quality and experience is often more important. Many institutions in the region have highly qualified personnel as far as academic degrees (M.Sc. and Ph.D.) are concerned, but some lack proper training in devising, conducting forestry research, training and extension. Some are trained in specific fields and become so specialized that they are unable to integrate into multi-disciplinary forestry research, training or extension, which is the common trend now. Management of forestry research projects in the Near East is often entrusted to people on the basis of their seniority or political affiliation. Some of them may turn to be successful managers, while others may fail due to lack of proper training in research management (El-Lakany, 1989). On the other hand, many institutions in the Near East suffer from the shortage of well trained assistants, who are as important to the research process as the researchers themselves. All personnel engaged in forestry research and training in the region need continued training, of one type or another, and the coordinated activities of continued education, study tours, seminars, workshops and specialized training are vital for the development of the forestry sector.

iii) Institutional Aspects

Institutional constraints to forestry research, training and extension in the Near East stem from the fact that most institutions lack well defined programmes. Intra- and inter-institutional communications are also weak as it is often the case that the contacts between researchers and management, between researchers and trainers or extension agents and between foresters and other disciplines, such as agriculture, sociology, economics, are not as strong as they should be. Furthermore, many institutions lack contacts with decision makers and field foresters, which puts them at a great disadvantage.

It has been noticed recently that in certain countries, where unemployment is high, large numbers of young graduates are assigned to forestry departments to be trained as researchers or extension agents, for internal political reasons. Such a practice imposes more constraint on forestry research institutions and the regional forestry departments.

iv) Financial Resources

The level of funding for forestry research, training and extension in the Near East is low relative to the total budget of forest operations, production and trade. Unfortunately, there are no figures to back up this statement, but it is based on experience in the region. It is also felt that returns on meagre expenditure in forestry research, training and extension are very low. One can argue that the returns are low because investment is low; but the low efficiency and effectiveness of the research, training and extension programmes themselves can be an equally valid argument.

Financial resources for forestry research in the Near East are mainly external (from bilateral and multilateral agencies) and partially national. The actual figures are also very difficult to obtain and, if available, difficult to verify.

One constraint associated with external funding of forestry research in several countries of the Near East is the competition among international development assistance agencies for institutions

and even research issues and personnel. It is frequent to find several agencies funding the same research topic and the same researcher(s) in the same country or institute. Therefore, coordination among donors is very essential.

Another financial constraint associated with forestry (and perhaps others) research, training and extension in the Near East is the low level of incentives paid to local researchers, trainers and extension agencies relative to the compensation of expatriates. It is common for local staff to draw only a regular salary, even if they act as full-time counterparts to foreign advisors. This creates a lot of difficulties to both parties.

Most of the constraints to forestry research, training and extension described above, can be overcome through organized support programmes and regional, sub-regional or national research and training networks. Practically all the ingredients for successful networking exist in the region including researchable problems, need for coordinated activities, personnel, facilities and, present and potential funding. On top of that, political will for tackling environmental problems climbed to new heights after UNCED 92.

7) CONCLUDING REMARKS

7.1. Lessons Learnt from the Analysis

A major weakness that emerged from the analysis of the forestry policies in the Near East is the lack of reliable statistics on forest resources, production and harvest. Equally, there is a critical need for clear forestry policies in most countries to replace "Statements of Intention". The analysis also stresses the deplorable state of the forests in the region due to human and animal pressures exacerbated by harsh environmental conditions and inconsistent management policies.

The state of forests and wooded lands in the Near East is very irregular and the pertinent information is either disparate or obsolete. The data received from the countries was combined with statistics from FAO to give a realistic picture. It is essential to inventory the resources to understand the tendencies. Four categories of countries can be distinguished in terms of forest cover: those where the forest cover is relatively high, such as Turkey and Cyprus; those where it is comparatively modest, such as Lebanon, Morocco and Yemen; those where forest cover is low, such as Pakistan, Syria and Tunisia; and those where wooded lands are rare or non-existent, such as Egypt, Libya and the countries on the Arabian Peninsula, with the exception of Yemen. Forest management activities are relatively dynamic in the Maghreb countries, Turkey and Iran.

The region has a major deficiency in terms of ligneous forest products. Nevertheless, the Maghreb countries, Turkey, Iran, Afghanistan and Pakistan produce a relatively important part of their requirements and even export certain products (cork, paper pulp or resin). The region is also well placed for the production of a large number of non-ligneous food and industrial products (cork, resins, gums, tannins).

The 11th session of the Near East Forestry Commission (1990) summarized the essential approach to forestry policy in the region. It concluded that the development of the forestry sector is influenced by the following problems: 1) political situation and wars in the region, 2) economic and financial constraints, 3) lack or shortage of management personnel, and 4) certain aspects of climatic changes.

Generally speaking, the role of the forest and the tree as tools for conservation and protection of the environment, receives a high degree of attention by the public and private sectors, particularly all aspects relevant to the fight against desertification, protection of watersheds and protection of dams and irrigated zones.

The forestry sector plays a major role in the fight against desertification in a number of countries (Morocco, Tunisia, Iran, Pakistan, etc.) by fixing dunes, offering wind protection (windbreaks), controlling soil salinity levels and the fight against water erosion. A large number of countries have also taken measures to conserve forests, particularly those that are State-owned, while recognizing the social importance of populations adjoining the forests and developing particular programmes for these people. In Tunisia, for example, the populations within a 5 km distance of forests, representing 800,000 people, are subject to particular social programmes.

However, fuelwood remains a major problem for a large number of countries in the region. Efforts being made to resolve the problem are well below what is required although reforestation by local populations and participative management are encouraged.

There has been a positive development in regional cooperation over the last 5 years with the re-launching of the "Silva Mediterranea" Forestry Commission in which most countries in the region participate, as well as the activation of the Regional Forestry Commission which held its 11th session in Turkey in October 1990. Sub-regional organizations, such as the Green Belt in the Maghreb countries, which particularly focuses on the fight against drought and desertification, have made some contributions to the development of regional forestry cooperation.

A number of countries have reviewed certain aspects of forestry legislation in order to encourage the participation of communities and populations in reforestation and environmental protection activities. For example, forestry legislation and policy in Cyprus was amended in 1987/88 to reinforce protection from fire, encourage a greater respect of the State forest heritage and reinforce the forestry institution. The law and regulation introduced in Turkey between 1987 and 1989 permit the partial transfer of the vast amount of State forest land to collectivities, whilst creating a forestry fund to encourage community and individual forestry activities. An improved level of management is envisaged in Pakistan, with State aid for the 830,000 ha of private and collective forests.

Forestry administrations differ greatly from one country to another. They are generally well structured in the Maghreb countries, Sudan, Turkey, Pakistan, Cyprus, and Iran. Forestry administrations in Lebanon, Syria, Jordan, Iraq and other countries need to re-examine their organization and introduce structural reorganization of the forestry departments.

The level of funding for the forestry sector remains insufficient but is nevertheless improving. The creation and improvement in the operation of forestry funds in certain countries means that their forestry sectors have guaranteed levels of financing, an essential aspect for ongoing reforestation projects. Forestry research organizations closely follow the pattern of the forestry administrations; however, some countries with low forestry resources have retained a dynamic approach. The financing of forestry research either depends on the development sector (10% of forestry funds in Morocco are used for research) or agricultural research. Desertification and arid zone research institutes have been created in Tunisia, Egypt and provided a positive impact on forestry research.

There have been very few changes in terms of training over the last few years. A certain number of national institutions within the region make a major contribution to forestry training on a regional level (Hassan II Institute and the Sale Forestry School in Morocco, the Médenine Centre in Tunisia, the forestry faculties at the University of Istanbul and the Black Sea University in Turkey, the Tehran-Karaj University and forestry faculty in Iran, the Regional Latakia Forestry School in Syria, and the Department of Forestry at Alexandria University in Egypt).

With the exception of those countries suffering from political upheavals and wars, medium and long term forestry planning is being gradually developed. Over and above its inherent multi-sectorial nature, this planning approach is operated in liaison with the planning to combat desertification and to conserve water resources (Morocco, Tunisia).

The beginning of the eighties witnessed considerable concern by governments and public opinion in the region over the increased rate of degradation of vegetation cover and land. The objectives of forest land restoration and conservation set by the forestry policies remained un-achieved (FAO, 1990a).

Long-standing reservations expressed about the success of large-scale protection and afforestation work were restated. In many countries, terraces and gradoni previously planted were

ploughed. In the drier parts of the region, survival and forest growth in planted areas were low; in other countries, the impact of forest fires increased.

Such realizations brought to the surface an important policy consideration that, whatever the size of forest restoration, soil and water conservation and desertification programmes, their usefulness will be limited in both time and space if carried out in isolation and without due consideration being given to the social and economic circumstances which made them necessary.

At the same time, a complete picture of the various functions of the forest resources and the needs for their development have become better understood, considering that:

(i) the demand for industrial forest products will continue to increase substantially in the future;

(ii) the critical need for environmental services, including recreation, is perceived more clearly than before;

(iii) the rural people will continue to depend heavily on goods and services from the forest, including fuelwood, which in several countries will remain an essential commodity;

(iv) wood will continue to be important for construction purposes, and similarly, non-wood forest products for food, cork, tannin, essential oils in rural areas, and for industry and exports.

A new strategy has therefore gradually emerged recognizing the need for:

- ensuring closer communication and coordination between the various natural resources agencies;
- building upon the traditions, aspirations and customs of rural communities and their local knowledge and management practices;
- improving communication and dialogue with the population, and involving the people in the development and regulated use of the renewable resources base;
- developing systematically the multipurpose functions of forest resources for the benefit of rural people.

Such needs have important implications for policy and planning, legislation, institutions, training, research and funding.

Although each country concerned has to determine its own forestry policy within the context of the overall socio-economic policy, certain aspects of forestry policy are common and valid for the region as a whole.

The effective integration of forestry planning with national development planning has yet to be improved. Forestry planning in the past has tended to be isolated from other sectors of the national economy, and this should be remedied. The forestry sector must receive clear guidelines from the

central planning authority on how to translate primary national objectives into secondary level objectives for forestry and into definable and attainable targets, policies and action programmes.

In addition, the forestry sector needs to be reviewed critically and central planners must be provided with alternative policies, strategies and advice on the range of options available at any given time. Such information must be based on the results of sector analysis which should establish a quantitative basis for assessing feasible goals and the framework to identify policies, projects and activities.

The starting point for the formulation of forestry programmes should, therefore, be an objective assessment of the current role of the forestry sector and its potential in the context of the national development efforts. This assessment should strive to reflect the wide variety of goods and services, whether they are marketed or not that forestry provides through its production and protection functions. Once this role has been determined, it should be possible to establish a range of options to enhance the effectiveness of the forestry sector in contributing to the attainment of national development objectives.

The economic and social demands made on the vegetation types of the region are far more intense than in other forest regions, (FAO, 1990a). Thus, management is faced with the serious problem of accommodating and harmonizing these demands with the conservation needs of the ecosystems. These acute problems could be smoothed out if linkages were developed with other land-use disciplines and the interactions were better understood. In the drier parts of the region, for instance, where irrigation is not possible and the dominant use is pastoral, development prospects can be greatly enhanced if livestock production is integrated with forestry under a silvo-pastoral system. The woody vegetation can be managed both to provide animal feed and to produce forest products such as gum arabic or fuelwood. In the less dry areas, where crop raising is possible under rainfed agriculture, the integration of forestry with agriculture improves the micro-climate, helps control soil, water and wind erosion and improves soil fertility, thus increasing crop yields. It could also provide additional income-generating products such as fuelwood, poles and fodder, in addition to basic food crops.

In considering this vital need for integration, the fodder resources should be given the utmost consideration. It is already clear that, irrespective of the type of intervention in the forest domain, fodder resources will not be sufficient to meet the feed requirements of the livestock population at the current level. In this regard, there are at least three critical issues which should be considered if sustainable development of fodder resources is to be achieved:

- the first, which is sociological in scope, is that permanent agriculture and animal husbandry, based on different ways of life and concepts of land utilization, cannot exist in isolation from each other. Consequently, the prevailing customs and ways of thinking need to be changed. Sound management of the forest/range lands must be matched by equally sound management of the adjoining cultivated areas. The desirable solution is, therefore, a regulated balance between pasturage in the forest and grazing in the cultivated areas;

- the second is based on climate. In a climate with a prolonged dry season, it is not possible to ensure, even with the practice of regulated grazing, a sound forest/range management. To temper the uncertainties of the treacherous dry climate, and the length of the dry season, substantial reserves of fodder must be constantly maintained.

It is necessary to create new resources by planting fodder trees in order to maintain an adequate fodder reserve;

- the third is related to the ownership of livestock (individual ownership) in relation to the ownership of fodder resources (communal/common ownership). This system leads to over-exploitation of the resource because each individual assumes that what is not consumed by his herds, will be consumed by others. Any improvement in fodder resource situations requires effective communal silvo-pastoral organizations and enforcement of collective management of fodder resources, as well as implementing community silvo-pastoral programmes which encourage people to manage the woody vegetation and to grow and protect trees themselves. Such types of organization have proved successful in Syria but have not yet been tried in many other countries of the region.

7.2. Major Policy Issues and Changes Needed

In re-orienting forestry policies, the potential contribution of forestry and forest industries to rural development should be evaluated. In addition, the following factors need to be fully considered:

- wood production *per se* need not be the primary objective in the drier parts of arid zones, except as a by-product of shelterbelts or soil stabilization measures;
- the dependence of people and livestock on forest lands needs to be recognized as a major component of forest management; policy should, therefore, aim at reconciling and harmonizing this requirement with overall management rather than treating it under the category of "forest enemies" to be suppressed or eliminated;
- soil and water conservation, production of fuelwood and non-wood forest products, wildlife management and recreation, should be the main goods and services to be aimed at;
- in view of the slow rate at which the environment responds to improvement, policy must provide for long-term and sustained action.

The conservation of plant and animal genetic resources in perpetuity and the preservation of samples of ecosystems as reservoirs of species diversity are crucial issues. The region is endowed with a great variety of landscapes, ranging from lakes and related aquatic flora and fauna to semi-arid and arid sites with corresponding xerophytic species to true desert conditions. This ecological diversity, appropriately managed, offers opportunities for the promotion of tourism and the advancement of scientific knowledge. Given the extent of the region, large areas could be developed and managed as national parks, wildlife sanctuaries and biosphere reserves for the generation of employment and creation of additional income.

The strategic orientations of forestry development of the Region were examined by the 11th Session of the Near East Forestry Commission (FAO 1990b). These orientations are fully confirmed by the analysis of forestry policies and they are summarized in the remainder of this section.

Because of population increases, housing and related infrastructure will continue to be among national development priorities in the immediate future. New cities and villages will have to be

established. Forests and trees can perform an important role in ameliorating the harsh environment of the region for human settlements. Green belts around cities and parks within towns can be integrated into urban planning, and their establishment around cities could be largely based on properly treated sewage effluent and the correct selection of tree species.

There is ample scope for greater and more sustainable food production and security through the introduction of trees and shrubs in land-use and the rational management of woody vegetation; increased production and improved distribution of fuelwood for domestic energy needs; increased diversification of the harvesting, processing and sale of products from woodlands and trees for the generation of employment and income; and conservation of genetic resources and improvement of micro-climate, all leading to improved production systems and improved welfare of the rural population.

This action programme is of particular importance to the region. It is situated at the interface between forestry, agriculture and livestock husbandry and aims at conserving the resource base of agricultural production, integrating forestry into agricultural systems and using land more rationally. The strategy for promoting this integration will require: a more effective presence of foresters and of forestry institutions at all stages of the decision-making process, as well as their participation in sectoral and inter-sectoral fora; more action in public education and use of the mass media; and a presentation of forestry's contribution to development in a way which will be understandable and convincing to politicians, planners and administrators. At the international level, there is a need for regional projects which catalyze TCDC (Technical Cooperation among Developing Countries) arrangements and cooperative networks.

An action programme which integrates forestry in land-use systems may involve many activities which could be grouped as follows, (FAO, 1990b):

- agro-silvo-pastoral development;
- integrated watershed management;
- urban forestry;
- forest facilities for recreation and tourism;
- forestry on marginal and arid lands;
- forestry for desertification control;
- evaluation of forest land and full integration of forestry activities in land-use planning;
- systematic support of tree growing and management by rural people themselves, under clear conditions of tenure and benefits distribution.

An important area for action for several countries in the region is the reduction of imports and a more effective and sustainable use of their forest resources. In view of the considerable needs for industrial wood, the Mediterranean Development Plan recommended in 1959 the creation in the region of 450,000 ha of production plantations. Several countries embarked on the preparation and

implementation of national reforestation plans. It was considered desirable to conduct this reforestation on agricultural land in the form of windbreaks and shelterbelts and mixed cultivation with pasture or crops. These objectives were to be achieved by the development of new techniques of tree cultivation (choice of fast-growing species, pruning, fertilizer application, disease control, etc.) and to involve farmers in this type of plantation. A similar orientation may be followed to reduce the growing shortage in wood products of local industries.

This action programme should facilitate the development of the following:

- intensified management of natural forests;
- intensified wood production in the agricultural sector;
- increased benefits from wood utilization;
- establishment of small-scale forest industries;
- processing and utilization of non-wood products;
- reduction of waste.

Fuelwood will remain in the foreseeable future a major source of energy and the most important use of wood in the region. The potential for renewable and sustainable supply should be actively pursued. Massive quantities of fuelwood are produced as a by-product of multi-purpose tree planting; there is considerable potential for increasing fuelwood production as an integral part of the community and farm forestry; and substantial fuelwood quantities may be obtained as a by-product of industrial forestry. The main precondition for success is that rural people perceive clearly that protecting and managing their tree resources is more beneficial to them than irrational exploitation. In this respect a considerable forestry extension effort is required. Thus, the fuelwood strategy focuses on increasing fuelwood supplies through actions integrated with the protection and management of existing resources and improved efficiency of end uses within a broader energy strategy encompassing all energy sources.

The action programme is made up of the following components:

- fuelwood/wood energy assessment and development;
- support to national fuelwood/wood energy development and systematic integration of fuelwood production as a major output of plantations and forest management activities;
- regional training and demonstration in support of fuelwood action;
- wood energy research and development mainly in arid and mountainous areas.

An essential strategic element for the conservation, management and utilization of forest ecosystems is that consideration should be given to the most appropriate means of dealing with the genetic resources of both plants and wild animals.

The action programme proposed in this respect, is made up of the following components:

- development of national networks of protected areas to meet the needs for conservation of forest ecosystems and of genetic resources of target species;
- assistance in the planning, management and development of individual protected areas and in promoting the development of appropriate management systems and techniques for conservation, on a pilot demonstration basis, of protected areas and *in situ* reserves;
- *in situ* conservation of plant genetic resources, as part of an internationally planned programme and involving national centres based on existing research institutions.

Strengthening forestry and forestry related institutions, governmental and non-governmental, is a key factor in successful forestry development. It requires an action programme based on the following strategic elements:

- integration of forestry development into national development;
- improvement of the administration of forest resources through appropriate utilization of institutional support mechanisms;
- active and integrated participation of all institutions and organizations operating in the forestry sector in order to make forest development efficient from a technical, social and economic point of view;
- institutional support to local participation, local organizations and the private sector;
- strengthening public forestry administrations and related government agencies;
- improvement of human capabilities in forestry to bring about a change of attitudes to forest development;
- professional and technical education and training and, in particular, vocational training; extension and demonstration;
- research and development.

7.3. Policy Instruments for Implementation

Forestry activities geared to protect soil and water, and develop forest resources, will only succeed if implemented and maintained over a long period of time. This means that sustained and consistent inputs should be provided to the sector. This should not be the responsibility only of governments but of all various groups in the national communities. The establishment of special mechanisms (taxes, forestry funds, incentives etc.) for ensuring at least a minimum level of permanent forestry programmes should be considered. In recent years, some countries (Morocco, Turkey) have established a forestry fund for afforestation in an effort to encourage individuals and communities to participate in the rehabilitation of degraded areas. Morocco is also considering the institution of a special tax on timber imports to support afforestation activities.

Given the extent of land degradation in the region and the imperative need for ecosystem conservation and development, it would appear justifiable that ways, other than public funding, be explored, e.g. pressure groups, eminent personalities, private donors, non-governmental organizations, professional associations dealing with environment and conservation, etc. (FAO, 1990a).

Restoration of logged-over stands to something closely resembling their natural status with similar species frequency and density is difficult given existing knowledge of arid and semi-arid forest ecology. Even enrichment planting of primary species in cut-over stands has encountered problems. A viable set of regeneration policies in logged-over areas would include: (1) selection systems favourable to natural regeneration, coupled with enrichment planting of native species; (2) incentives for farmers to undertake regeneration; (3) more budgetary and scientific resources for regeneration research programmes; and (4) more support for government regeneration efforts by international lending institutions. Plantations are an essential part of any programme to conserve natural forests because they create an alternative source of supply to meet growing domestic demands. Policies that promote investment in tree plantations can help reduce demands on natural forests. A number of countries have adopted incentive programmes including tax benefits, concessionary credits, and guaranteed markets to stimulate private investment in plantations. Adverse policies that exacerbate losses of natural forest resources must also be changed.

Neglect of non-timber forest products is also an adverse policy. Most Near East country governments do not even collect information on the annual value of production or export of dozens of valuable non-wood products that are harvested without damaging the forest ecosystem. New policies to protect non-timber products may not be needed, but export taxes on them should be removed and export controls relaxed except, of course, for trade in sensitive or endangered species.

Traditionally, local communities have been more sensitive to these benefits, while some central governments have tended to regard forests as immense timber warehouses. Even then, central governments have not been effective resource managers, nor have provincial or State governments done much better. The transfer to private hands of permanent rights to natural forests is not a realistic option in most countries (both for constitutional and other reasons).

Experience does suggest that unambiguous local communal or collective ownership of forest property rights has been more consistent with conservation of all forest values than has central government ownership. Accordingly, a larger share of formal rights to natural forests should be returned to local jurisdictions, where long-standing traditions of forest use exist, to county governments or to village cooperatives. Central governments would retain sovereign taxing power, and therefore would not give up forest revenues, though revenue-sharing with local communities is not only equitable but also effective in ensuring their interest in resource management. Reversion would mean principally that more decisions of forest management and land-clearing for agriculture would be in the hands of local groups with a continuing stake in the multiple benefits that natural forests provide.

Finally, national forestry policies will need to recognize the participation of people in forest development and conservation; they need also to attempt to intensify and diversify the goods and services of trees and forests. Such policies will have to place more reliance on people's participation and on the use of local organizations. Existing legislation may need to be adapted to transfer at least part of the responsibilities and benefits to local people. Cost-effective systems of technical support and credit and incentive systems have to be designed to stimulate people's interest and involvement

in forestry. Adequate mechanisms for closer coordination with agriculture and livestock services are required to ensure integration and complementarity in land use and full realization of the potential of the land.

The type of local organization has an important bearing for the enhancement of forestry's contribution to development in the region. This is irrespective of whether the communities own the land or not, and holds true irrespective of the form of their cooperation with the forestry services. Cooperative structures appear particularly promising as they can accommodate a variety of needs and wishes such as collective tenure of land or communal regulation of grazing rights or natural resource use. Whatever organizational system is employed, the exploitation methods must be based on, and take into full consideration, traditional techniques which are understood by farmers and herdsmen and, more important, have proved to be well adapted to local ecological conditions.

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This FAO Forestry Paper has been compiled jointly by the FAO Forestry Policy and Planning Division and the FAO Regional Office for the Near East as a result of a regional forestry policy review carried out in 1990-92. It is based on the response of several countries of the region to questionnaires prepared by FAO, country reports, case-studies and statistics, as well as other material prepared by FAO, and will directly address forestry ownership and administration; management and utilization of the resource base; policies in the Near East; and research, training and extension.This paper is intended to analyse policy statements in the Near East and to promote the coordination of regional forestry policies. It should facilitate the exchange of information and experiences to avoid fragmented efforts and ensure complementarity and coherence in action, especially in the light of the awareness regarding sustainable development and environmental conservation in response to Agenda 21 of the United Nations Conference on Environment and Development.

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