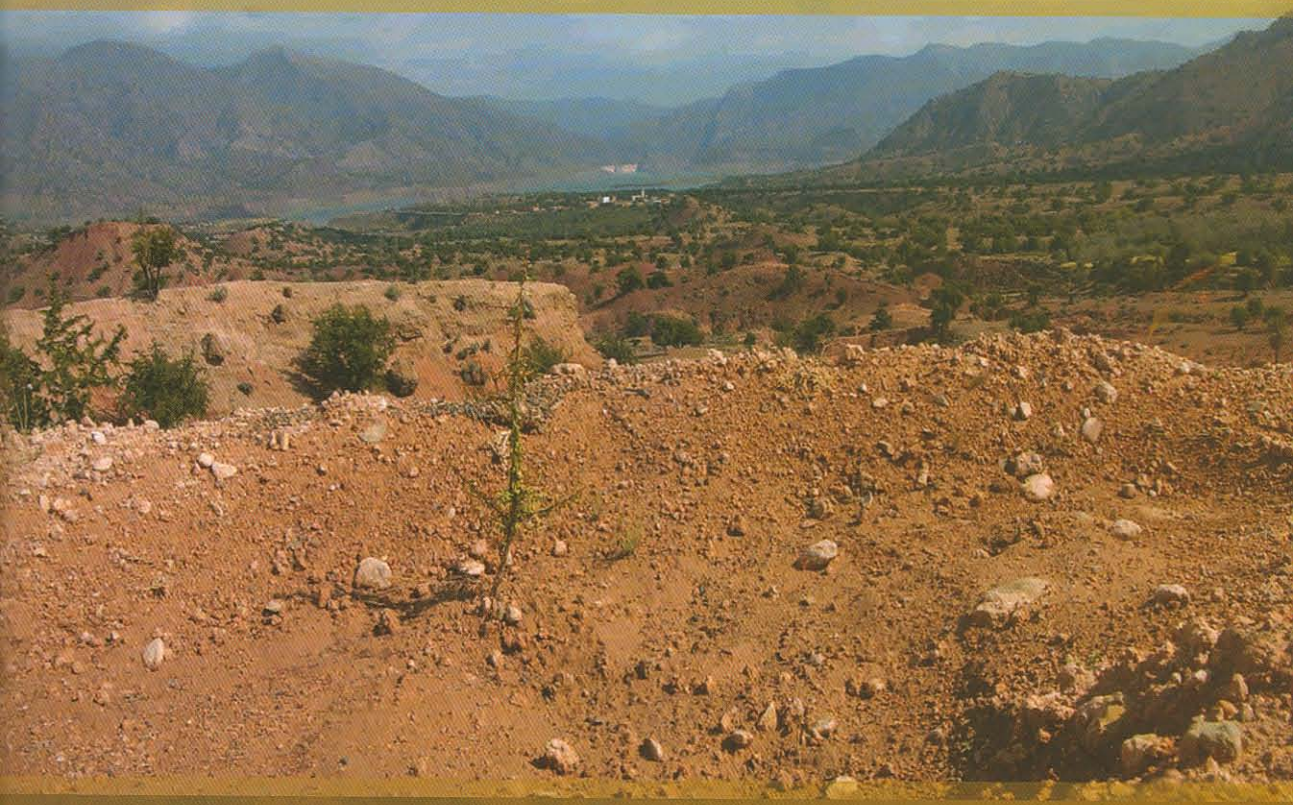
NEAR EAST FORESTRY COMMISSION (NEFC)

GUIDELINES FOR

GOOD FORESTRY AND RANGE PRACTICES

IN ARID AND SEMI-ARID ZONES OF THE NEAR EAST

WORKING PAPER - RNEO 1-09



FAO Regional Office for the Near East
Cairo, 2009

Disclaimer

The purpose of this working paper is to provide early release of information on ongoing activities and programmes and to stimulate discussion and collaboration. It does not reflect any official position of FAO. Please refer to www.fao.org/forestry and www.fao.org/world/regional/RNE for further information.

Comments and feedback are welcome.

For further information, please contact:

MoujahedAchouri
Chief, Forest Conservation Service
FAO Forestry Department
Viale delle Terme di Caracalla
00153, Rome, Italy
Tel: +3906 5705 4085
Email: Moujahed.Achouri@fao.org

Or

Pape Djiby Koné
Senior Forestry Officer
Executive Secretary, NEFC
FAO Regional Office for the Near East
El Eslah El Zerai Street, 11 Dokki, Cairo
PO Box 2223, Cairo, Egypt
Tel. +202-3-3316000 / +202-3-3316136 (direct line)
Email: Djiby.Kone@fao.org

Bibliographic citation:

FAO. 2009. *Guidelines for good forestry and range practices in arid and semi-arid zones of the Near East*. Cairo, FAO Regional Office for the Near East.

Photo credits:

P.D. Koné and H.O. Abdel Nour

NEAR EAST FORESTRY
COMMISSION (NEFC)

GUIDELINES FOR

GOOD FORESTRY AND RANGE PRACTICES

IN ARID AND SEMI-ARID ZONES OF THE NEAR EAST

WORKING PAPER

Regional Office for the Near East
Cairo, 2009

TABLE OF CONTENT

LIST OF ACRONYMS

ACSAD: Arab Centre for the Studies of Arid Zones and Dry Lands
AfDB: African Development Bank
CBD: Convention on Biological Diversity
CBO: Community-based organization
CDM: Clean Development Mechanism
CIFOR: Center for International Forestry Research
CILSS: Interstate Committee on Drought and Desertification Control in the Sahel
CPF: Collaborative Partnership on Forests
FAO: Food and Agriculture Organization of the United Nations
FLEG: Forest law enforcement and governance
GIS: Geographic Information System
ILO: International Labour Organization
IPF: Intergovernmental Panel on Forests
ISESCO: Islamic Educational, Scientifc and Cultural Organization
IUCN: International Unionfor Conservation of Nature
LFCC: Low forest cover countries
NEFC: Near East Forestry Commission
NGO: Non-governmental organization
NWFP: Non-wood forest product
OSS: Sahara and the Sahel Observatory
TP-LFCCs: Tehran Process on Low Forest Cover Countries
TOFs: Trees outside forests
UNCCD: United Nations Convention to Combat Desertification
UNEP: United Nations Environment Programme
UNEP-ROWA: UNEP Regional Office for West Asia
UNESCO: United Nation Educational, Scientific and Cultural Organization
WWF: World Wide Fund for Nature

LIST OF BOXES

FOREWORD

The Near East Region (including North Africa) includes a variety of climates but the xeric, arid and semi-arid conditions dominate. These impose limitations to the extent of plant communities and their forms and dimensions. Low grassy expanses, steppes and semi-arid savannah are the most prominent formations sometimes covered by forestry techniques in drylands of the Near East and North Africa. At times, local conditions in particular sites with deep soils and significant superficial moisture will allow the growth of dense formations of dry forests made up of Acacia species. This mix of complex formations is intensively used by communities of the region for their traditional subsistence, for the adornment and amenities in inhabited areas, but also for the various needs of evolving modern utilizations engendered by new ways and standards of life. Forestry must accompany these uses and relevant changes affecting them. Today a number of tools are at the disposal of foresters in concepts, theories and practice in arid zone forestry in forest management and in the creation of planted forests or other structures to protect human settlements. Foresters must use all the tools available in a proper way to secure the sustainability of their work. Guidelines are focused indications and information that should help them advance without forgetting or neglecting major important steps in the concept, preparation and implementation of activities.

Since 1992 at the wake of the UN Conference on Environment and Development, the Rio Conference, the international forestry agenda has been very active and dynamic, developing through various forms of fora a very productive international dialogue. There was first the Intergovernmental Panel on Forest (IPF) from 1995 to 1997, the Intergovernmental Forum on Forests (IFF) from 1997 to 2000) and later, still active, the United Nations Forum on Forests (UNFF) established in 2000. This series of international processes have produced an impressive amount of materials (principles, guidelines, recommendations, criteria and indicators for resource management…) of general, specific and geographical (regional, sub regional) relevance to support sound forestry and forestry practices. Some 270 proposals have been put forward looking at every aspect of forest governance and practice and aiming at the promotion of "…the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end…" Forestry and foresters need to incorporate all the wealth yielded by the decade long intense international dialogue on forestry in their approaches, operations and technical packages so as to respond to the ever diversifying needs of today's communities. The guidelines to forestry practice help produce a number of indications and tools to help in this endeavour.

Foresters of the region have actively supported and participated in the Low Forest Cover Countries' initiatives (LFCC) under the aegis of IPF and requested the support of relevant organizations to this process. Along with this, they have asked FAO and partners to assist in the formulation of guidelines relevant to the region. More specifically, the 17th session of the Near East Forestry Commission requested FAO to assist and start a process of formulating guidelines on forestry practices in the Near East. This process was effectively initiated in the late 2007 and since then has been

readily developed by FAO's Regional Office for the Near East along the following steps:

- Setting up of a core group of Experts which met in December 2007 in Alexandria Egypt, to define framework and key elements the planned guidelines;
- Such work was circulated for comments and suggestions to various countries and Organizations in the region, and was further endorsed in February 2008 by the 18TH Session of the Near East Forestry Commission;
- In July 2009 in Tunis, a second expanded meeting of the Working Group was organized which examined an advanced version of the draft guidelines. This version was again subsequently submitted to various stages of improvement including intensive consultations with various players at governmental and intergovernmental levels and with relevant NGOs within and outside the region.

The resulting product has thus benefited from an extensive consultation with professionals and organizations of the region and should be now in a stage to reasonably respond to various needs and expectations. Its users are encouraged to keep interacting with FAO to start and maintain an improvement process through use and comment for better next editions in the future.

Mohamad I. Albraithen
Assistant Director General
FAO Regional Representative

Jan Heino
Assistant Director General
FAO Forestry Department

ACKNOWLEDGEMENTS

The preparation of these guidelines was coordinated by Mr. Pape Djiby Koné, Senior Forestry Officer of FAO-Regional Office for the Near East, in collaboration with the Forest Management Division, FAO-Rome.

The following national experts participated in the exercise:

Eng. Mrs. Hoda S. Rashed (Egypt); Prof. Youssef Fahmy Awadallah (Egypt); Prof. Talaat Omran (Egypt); Prof. Mohamed El Baha (Egypt) Dr. Sabah Al Kawaz (Iraq); Mr. Soheil Mohajeri (Iran) ; Dr. Mostafa Jafari (Iran); Mr. Suleiman Abdelaziz Rashid (Jordan); Mr. Fady Asmar (Lebanon); Mr. Ezeddin Hassan Abusrewel (Libya); Mr. Ahmed Ould Abdel Vetah (Mauritania); Mr. Abdelaziz Hammoudi (Morocco); Mr. Khaled Al Mossa (Saudi Arabia); Mr. Ahmed Ridha Fekih (Tunisia); Mr. Saïd Helal (Tunisia); Mr. Erdogan Sirin (Turkey) and Mr. Jameel Abdulsamad Saif AL-Emad (Yemen).Among Organizations which provided comments and advice during the review of the initial draft, were: ACSAD, AfDB, CILSS, OSS, ISESCO, TP-LFCCs, IUCN, UNEP-ROWA. Some of these Organizations further participated actively in the second experts meeting to finalize the draft document and endorsed it as full partners of this initiative.

The process was facilitated by a team of resource persons: Mr. El Hadji Sène and Mrs. Prof. Irina Springuel. Dr. Hassan O. Abdel Nour assisted in the final review and provided most of the pictures illustrating the document.

Financial support to supplement FAO budget, was granted by the government of Norway through the FAO-Norway Partnership Programme.

I. SETTING THE STAGE: OVERRIDING NATURAL RESOURCES RELATED FUNDAMENTALS IN THE NEAR EAST REGION

The experts meeting to launch the preparation of these guidelines has identified and stressed some fundamental truths and strong principles. These are at the root of the socio-economic issues relating to natural resources management and conservation in the region. Every concept, policy, programme, planning and implementation action should consider them as founding principles to take due account of. In consequence activities should be conceived, planned and implemented taking into account the following:

- The special geographical and climatic features (scanty and erratic rainfalls; high saturation deficit, drought spells in short critical periods of plant growing season, insulation, …) present particular constraints for forest related activities and due account should be taken of them;
- The Near East is a water deprived region in which rains and surface water resources are very limited if at all present. Competition for the resources among plants and animals and with other human activities and interventions is very high and tends to manifest itself early in any process. Policies, plans, programmes, and implementation activities (plantation, soil and water conservation initiatives and works, watershed management …) should take due account of this situation either through better adapted species and options, or by expanding the resource to the extent possible through water harvesting and other traditional water management techniques;

Box 1. OASES, FLOODPLAINS AND OTHER WETLANDS: CONTRIBUTION OF DRYLAND FORESTRY TO THEIR PROTECTION AND MANAGEMENT.

In dry lands, water related ecosystems such as oases, floodplains and any form of wetlands are very rich islands in very adverse environments. They are threatened by many factors including:

- dryness and low hygrometric pressure which exert hardship on the difficult living conditions of plant formations and animal communities;
- Wind prevalence which further reduces air moisture, exerts strong physical pressure on vegetation and imposes dwarfed forms;
- Sand movements which entail peltering and burial of plant formations and sanding of the rich soils in oases and wetlands, altering their life supporting capacities;
- Heavy human and animal pressure on grass and woody formations, making conservation of resources, sustainable management and regeneration difficult and costly goals to realize.

Forestry has a potent role to play in safeguarding the precious capital of water rich ecosystems in drylands. Activities should be carefully planned, technologies tuned to the difficult conditions of the area mostly using local species or carefully introduced ones from ecologically close or similar areas. They should aim most at the following:

- protection through reduction of grazing, cutting and trampling of related areas, including with fencing and closure;
- dryland plantation and agroforestry;
- sand dune stabilization with little water demanding species;
- Careful monitoring of plant growth and development;
- Wherever relevant, conservation of natural riparian vegetation along river, lake and wetland banks, securing a sustainable natural self-protection of the ecosystem.

- Forestry in this region is closely related to range management and should be understood in a wider sense. It should inter alia complement range management and cover all relevant plant resources supporting the whole set of forest, range, land management including trees, shrubs and other economically important plants and relevant plant material handling and conservation techniques or implements, including seed bank;
- The scope of activities and main goals are strongly tied to land management, control of land degradation and in general combating desertification. Due consideration to implementation and application of the United Nations Convention to Combat Desertification (UNCCD) will be their overarching framework and goal;
- Other main international framework conventions and programmes focusing on natural resources, and strongly relevant to the region, within the context of areas targeted by the guidelines, will be kept in mind and catered for:
    - Biological diversity of the region is fragile and is seriously threatened due to a number of human activities, environmental changes and degradation. Balanced use of the biological resources is essential and due regard to the Convention on Biological Diversity (CBD) is mandatory. Its implementation

Sand Dune fixation biological Yemen (HOA)

Sand dune fixation using petroleum mulch I.R.Iran (HOA)

should be among the strongest objectives of natural resources management policies.

- Climate change will strongly affect water resources, plant communities and wildlife in the region and probably alter societies' needs of them for goods and services. The guidelines should help to better understand and anticipate these changes, target interventions to buffer their impacts and facilitate adaptation. The zones and processes to be likely most affected by climate change will include:
    - The aggravation of a few human induced phenomena like forest fires, erosion processes, floods and droughts in a severe rise of antagonistic events;
    - Availability of fresh water resources mainly generated from seasonal rains and diminution of natural lakes and ponds will probably occur;
    - A number of changes in species composition and structure of plant communities will certainly affect local livelihoods;
    - Shorelines may move inland and the coastal landscapes will change affecting or improving a number of opportunities linked to e.g. mangrove ecosystems, sand related formations and a number of biologically rich wetlands.

- Linkages and cooperation today should be maintained with the United Nations Framework Convention on Climate Change (FCCC) Executive Secretariat to use all the mechanisms and funding facilities offered in this framework to defend and expand relevant forest, tree and shrub formations in landscapes of the Near East;

The water resources being scarce and easily altered, protective provisions and some principles and measures of the Ramsar Convention on Wetlands, are well featured in the guidelines regarding their management and conservation.

- In this region, forestry along with range management, deliver goods and services including, mostly, food, fodder, fuels, materials for handicraft and other non wood forest products (NWFP), rather than timber, as usually expected from forests. The wildlife resources depend on, and belong to, the ecosystem. The guidelines recognize and take into account such state of resources and facts;
- Approaches to natural resources management need to be and should be associated in a proper blend of various geographic, climatic, human, social, traditional, historic factors and perspectives. Integrated ecosystem approaches seem to be the most appropriate ones for conservation, management and development of the resources and should be explained, promoted and used in project development in the sub region.
- The region holds a sophisticated and delicate social fabric with many values strongly influencing communities and groups. The principal actors include nomad herders, gatherers (medicinal plants, arabic and other gums and resins…), farmers… etc. Leaders of those communities have great knowledge and command of local land use systems which better accommodate the needs of local people and foster their greater involvement. They should then be thoroughly consulted, empowered and involved in forest and range management related activities which should be based, among others, on due considerations of links with their leaders.

- Gender balance has particular features in the sub region; women issues and needs should be fully taken into account and activities should be devised and implemented accordingly. Steps for change should be carefully conceived, planned and implemented in close cooperation with concerned groups and people.

II. GUIDING PRINCIPLES

The Guiding Principles are the key elements that need to be considered for sustainable management of forests, trees and rangelands in the region. Taking into consideration the overarching principles stated in Section I, seven key principles have been identified. The understanding and application of these principles and recommendations will be determined by the prevailing governance, economic, cultural, social and environmental conditions at country and local level.

The principles apply to all kinds of institutions, including national or local governments, the private sector, non-governmental organizations and the civil society. They do not replace existing national or international laws, commitments, treaties or agreements. Their application is totally voluntary.

1. DEVELOPING, CONSERVING, ASSESSING AND MONITORING FOREST AND OTHER WOODED LANDS

In the light of the particular features and characteristics of forests, wooded lands and trees in dry lands and their limited extent, necessary measures must be taken to preserve the existing resources and to implement management and silvicultural activities (tending of existing forests, reforestation and afforestation) in order to expand the resources whenever possible. Due attention should be given to national and international reporting on the existence and extent of forests, and other wooded lands, as a tool for decision making.

The recommended options should be, but are not limited to:

- Build national capacities on assessment and monitoring techniques;
- Take necessary measures to assess and monitor forest, range and tree resources, using modern technology (GIS, Remote Sensing…) whenever possible;
- Build national data bases based on regular assessment of the forest, tree and range resources;
- Regularly update and monitor the forest and range policies in overall land use planning

- Establish a comprehensive national reporting system in accordance with the Criteria and Indicators for Sustainable Forest Management (C&I), on all features of the forest, other wooded lands, trees outside forests, rangelands and land use changes;
- Establish policy and incentive programmes to extend forest and resources and plant cover on degraded and marginal lands
- Develop participatory programmes and establish appropriate incentives for the rehabilitation of degraded lands through afforestation, reforestation, tree plantation and natural regeneration (refer to guidelines on planted forests);

Tree planting for village protection Iran (HOA)

Range development on marginal lands UAE (HAO)

Box 2. PLANTATIONS IN DRYLANDS

Plantations are resorted to in drylands in a number of specific situations including i) production plantations when seasonal rainfall is enough to give initial boost to seedlings and sustained growth in following years; ii) when site protection is needed such as sand dune stabilization, wind breaks, line planting where needed and possible; iii) river bank and slope stabilization… etc, and any other suitable situation. The FAO guidelines prepared for planted forests are valid for most dryland plantations establishment and should be referred to and used. The major thrusts of issues to keep in mind refer to the following:

- Water availability is among the most difficult and constraining factors in arid land plantations and should of course be first considered especially as regards quantity and quality. Salt and other mineral contents are key to determine water suitability for plantation;
- Land availability and quality are the second most important factors to take into account as they may have strong detrimental consequences as per their texture, structure and chemical characteristics;
- Species selection should be carefully taken care of with special considerations to objectives of planting and related suitability of species envisaged;
- Seed production, preparation and conservation should consider the vulnerability of seeds to insect attacks and their relatively hard nature for germination, needing the use of artificial methods to facilitate it;
- Tending and protection of plantations are essential and particular attention should be devoted to fencing to ward off livestock and wild animals;
- New techniques of land works are gaining importance in plantation techniques as deep tillage and ridging are known and more and more considered to improve water economy and hence success, growth, survival of seedlings and overall behaviour of plantation forests;
- Plantations should be carefully managed as they may facilitate unwanted dispersal of seeds of invasive species.

2. ASSESSING, PROTECTING AND SUSTAINABLY USING BIOLOGICAL DIVERSITY OF FOREST AND TREE ECOSYSTEMS

Dry lands and forest tree ecosystems are often very rich gene pools of those species/provenances most appropriate and adapted to the prevailing harsh conditions. Furthermore, they are the home of many wild relatives of important domesticated plant and animal species. Appropriate measures should be taken for the assessment, protection, development, sustainable management and use of genetic resources contained in forests and rangelands ecosystems.

The recommended options should be, but are not limited to:

- Develop and implement appropriate legislation (policies and laws), including demarcation of the forest estate and avoid encroachment on and fragmentation of forest lands, oasis, mangroves and other specific ecosystems;
- Encourage development and application of policies and regulations in order to prevent the conversion of such ecosystems to other land uses;
- Encourage preparation and development of action programmes for protection and rehabilitation of fragile ecosystems, especially mangroves;
- Recognize the role and importance of wildlife in the region and take measures for its adequate conservation, management and development;
- Plan activities for the conservation, rehabilitation and sustainable use of biological diversity including the establishment of new protected areas, particularly to protect endangered ecosystems and/or scarce or endangered animal and plant species;
- Further integrate and implement biological diversity concerns into land use planning and management (forest and rangeland related biological concerns);

Box 3. WILDLIFE AND PROTECTED AREA MANAGEMENT IN DRYLANDS OF NEAR EAST AND NORTH AFRICA

Drylands in the region have a spectacular and diversified wildlife in beautiful landscapes featuring the large expanses of shrub lands, steppes and deserts. Many of these have been designated as sanctuaries, nature reserves or National Parks. The wildlife is constituted by species such as gazelles, Oryx, addax etc. They are strongly adapted to the harsh climatic and resource conditions .They are easily hidden by their colour adaptation .They are agile and fast sprinters to out run their predators.

Forest and range management in the region should be closely linked to the management and conservation of wildlife resources. The issues linked to wildlife management and wilderness protection refer often to the need of some integrated approach to attend to and meet many objectives:

- Vast areas are often associated with difficult access, which makes management difficult and movements costly;
- Conflicts in the use of resources are numerous as wildlife and domestic livestock often compete for the same pasture and water resources;
- Cases of wildlife, agriculture and human conflicts make populations hardly responsive to conservation initiatives when these mean restrictions of access to water and fodder resources;
- Poaching has been made progressively easier as new means of wireless communication and transport with four wheel drive vehicles have become available and easily affordable;
- There is a growing market for bush meat and trophies in many areas, but also for hunting big game, an opportunity that could be put to good use by resources managers;
- Conservation as a whole is a well accepted objective in policy and planning circles, but implementation and sustained commitments are week.

Forestry, range management and nature conservation should be considered as a composite objective and catered for in comprehensive resource use policies. In the region, range and forestry services, water and agriculture administrations, the regional and international organizations concerned with conservation (IUCN, WWF, FAO, UNESCO, UNEP … etc.) should of course consult and work very closely together. The operations officers on the field should be apprised of the needs for these concerted approaches if their work is to succeed and bring sustainable results in conservation of wildlife and management of protected areas in drylands.

- Assess, monitor and conserve biological diversity in sacred, cultural and traditional sites;
- Promote community participation in protecting biodiversity, and encourage benefit sharing;
- Undertake appropriate selection of species/provenance and encourage the use of native species/provenances in plantations;
- Adopt necessary measures in order to avoid illegal use of resources, including illegal cutting of vegetation and illegal hunting;
- Raise awareness of and take measures against risks of invasive species to natural biological diversity;
- Establish gene banks for the conservation of forest, range and tree species;
- Adopt sand dune fixation and other land management measures, preferably using local species to the greater extent, to protect biodiversity in oasis and other particular ecosystems at risk.

Range development Iran (HOA)

Box 4. NATURAL RESOURCE DEGRADATION AND FUTURE OF NOMADISM

Nomadism is an often perfect strategy to adapt to changing living conditions and to better access and use the resources. Nomadism is exercised within specific and well established natural settings which have been studied, known and mastered through centuries of interaction between people, plant and animal resources and the terrain. The complementarity of locations, the availability of resources according to seasons and events are well known in those settings. In the context of changing landscapes and growing interferences between people, animals and the plant resources and continuous addition of new users, the balance that supports nomadism is quickly being altered and nomad communities and behaviour are progressively being threatened. It is in this context that the question is raised of the future of nomadism with the heavy trends of natural resources degradation. The issues of resource degradation and nomadism include among others the following major points.

- Changes in rainfall patterns upset the traditional behaviour of nomads and weaken their coping strategies based on their knowledge of secular events;
- Geographic modifications – new roads, newly settled urban areas, mining operations … etc - not only affect tracts and camping areas, access to water resources, but also may change land use, especially range location and access;
- Large expanses of natural formations are constantly being developed introducing new alternatives to the utilization of resources but also robbing nomad communities of a sizeable part of their young population, thus affecting the future of nomad communities;
- Overall changes in the landscapes combined to new transport facilities especially the advent of four wheel drive vehicles are drastically modifying traditional patterns of movements and settlements in many areas of the near East and North Africa;
- Under these conditions rapid access to resources are raising the rates of degradation in a number of cases..

All these developments which often negatively change the natural resources, do affect access to land, water resources, pastures and practices in established traditional trade linkages. These in turn of course are deeply affecting nomad communities and putting at risk their future and the future of their freedom to move and to appropriately use the resources of shrinking territories.

3. MAINTAINING OR IMPROVING HEALTH AND VITALITY OF FOREST AND OTHER WOODED LANDS

Measures aiming at maintaining the health and vitality of forest, tree ecosystems and other wooded lands should be developed and implemented, particularly in relation to protection against fire, pests, diseases and pollution.

The recommended options should be, but are not limited to:

- Increase awareness at all levels of threats to health and vitality of forests, trees and other woody vegetation.
- Adopt forest and range management practices that secure the sustainability of both systems while contributing to the prevention of forest fires and outbreaks of forest pests and diseases.
- Implement policies and programs involving communities, for participatory forest fire management, including improved prediction, prevention, rapid response to emergencies and restoration after fires. (refer to guidelines on forest fires);
- Implement policies and programs for management and control of invasive species; and promote trans-boundary collaboration.
- Promote the use of species/provenances well adapted to the site conditions, favoring indigenous species whenever possible;
- Adopt integrated pest management approaches and the use of biological control of insects and diseases whenever possible and foster relevant adaptive research to that effect;
- When biological control is not possible, use the most appropriate and least harmful interventions with the implementation of effective measures to limit damage caused by such interventions.

- Adopt systematic monitoring for health & vitality of forests, trees and woody vegetation

4. MAINTAINING THE PRODUCTIVE FUNCTIONS AND SUSTAINABLE USE OF FORESTS AND OTHER WOODED LANDS

Call is made to develop and implement policies strategies, and activities that encourage and support the sustainable productive functions of the forests in order to increase their social, economical and environmental contribution to livelihood systems. This should be better done through a participatory approach involving all stakeholders.

The recommended options should be, but are not limited to:

- Design and apply appropriate management models for dryland forests and other wooded lands;
- Adopt necessary institutional and legislative measures to avoid illegal harvesting of forest and range resources;
- Enhance production of tree resources in the landscape through their protection and management as well as application of agro-silvo-pastoral systems;
- Adopt appropriate silvicultural techniques to enhance and increase productive functions;
- Use appropriate species/provenances, genetically improved material or well-adapted genetic resources to enhance productivity;
- Assess, document, valorize and promote forest goods and services with a particular emphasis on NWFP;
- Organize, promote and monitor use, processing and marketing of forest goods and services;
- Generate enabling conditions and incentives for the private sector to invest in relevant forestry activities;
- Raise awareness of alternative energies and their economic and environmental potentials;

- Reduce pressure on wooded lands caused by fuelwood gathering through:
    - i- Adoption of better management practices to enhance fuelwood production;
    - ii- Design and promote most efficient conversion ways and technologies to use wood energy for domestic purposes;
    - iii- Facilitation of access of local populations to alternative energy sources, such as solar and wind energy systems, as well as modern biomass transformation/combustion techniques.
    - iv- Provision of an enabling environment to provide fuelwood operators with alternative income generating activities.

Box 5. REVIEW OF NWFP OF IMPORTANCE IN LOCAL USE AND WORLD TRADE

Vegetation of drylands and in particular in the Near East and North Africa produce a variety of non wood forest products used in various applications and production systems essential in sustaining the livelihoods of local communities or sometime creating important business and work opportunities. These commodities effectively contribute to the well being of local communities and to reducing poverty. They include i. a. Arabic and other gums; corks; dies and paints; incenses; a variety of nuts; tannins and various other products of local relevance. Most of these products are collected from the wild in natural formations. Silviculture and plantation forestry have a potential in improving the plant communities that produce them through conservation and management techniques and through planting with a number of species.

- Arabic gum producing Acacias are distributed in the Near East and sub-Saharan Africa in the Sahel zone. Sudan is the major producer but all countries bordering the Sahara may be producers from many acacia species or other Combretum, Commiphora, and other genera. They include Chad, Ghana, Mali, Mauritania, Niger, Nigeria, Senegal and Somalia Many other tree species are gum producers but the quality and the flexibility of use do not equal Arabic gum which now has an established international market;
- Cork oak is a narrowly distributed Mediterranean species. Production opportunities are very good in the Maghreb. Cork forests are threatened in those countries as many and increasing intensive uses are exerting strong pressure on them;
- Dies and paints are extracted from some species of North African and Near East drylands with locally known practices/ technologies. Further knowledge of these should be collected and disseminated;
- Incenses: are collected from a number of species including Daniella, Boswellia, Commiphora… etc. On both sides of the Red Sea, incense species such as Commiphora are found and can be managed, mainly through protection and fire control. Incense represents a huge market supporting the livelihoods of many persons from collectors on the wild to the many traders in city markets in countries like Ethiopia, Somalia, Sudan and Yemen;

- Many other products including nuts, tannins … etc are collected from natural plant communities of the sub region. They have a great economic importance and should be further researched to secure better conservation techniques, more relevant management approaches and larger options for plantation forestry practices in drylands.

Cork Morocco (HOA)

Manual sorting Gum Arabic Sudan (HOA)

- Establishment of tree plantations, including by local communities, in order to increase production of wood for energy and reduce pressure on native forests and wooded lands;
- Encourage utilization of treated waste water resources to establish irrigated planted forests, carefully evaluating the potential risks for health and ground water contamination;
- Design and promote appropriate techniques, including water harvesting, and material to increase water holding capacity of soils and water use efficiency by plants.

Box 6. TRADITIONAL WATER CONSERVATION TECHNIQUES IN THE NEAR EAST: HOW THEY CAN SERVE FORESTRY AND RANGE MANAGEMENT

Water is a resource in very short supply in dry areas and is at the same time a very strategic item for human consumption and other development activities such as agricultural and food production, development, forestry & tree planting, animal husbandry and pasture management. Populations in the Near-East sub-region have developed a host of local level techniques to collect, conduct, distribute and finally utilize water. All forestry and range development schemes should avail themselves of these techniques through water resource conservation, water collection & conveyance, water utilization and protection from pollution. The traditional principles and technologies that support water management and economy are useful and should be explored for any forestry activity at various levels:

- Protection and conservation of underground and surface water from sanding processes: a number of techniques concur to reduce wind speed around wells and canals so that sand drifts are not formed to cover water points;
- Transport of water in underground canals: This is a well known technology in the sub region in which systems have been established centuries ago which secure safe transport of water;
- Drawing water from wells and ponds: The noria gessour,saqqia, shadouf, ..etc systems have been conceived in the region and their establishment and use are still resorted to in irrigation systems and for nurseries;

- The small stone dams, terraces, ridges and similar structures for harvesting of run-off rain water are well known in the region and should be helpful in small to medium size nursery sites or activities in soil and water conservation work;
- The recycling of sewage waters is becoming standard practice in countries of the sub region. Nursery establishment should take advantage of or explore such options. A number of countries have already acquired solid expertise in the matter, including Egypt and Yemen.

Water harvesting Western Sudan (HOA)

5. ENHANCING THE PROTECTIVE FUNCTIONS OF FORESTS AND OTHER WOODED LANDS

Policies and strategies that encourage and support the protective functions of forests and other wooded lands in order to maintain/increase their contribution to sustainable livelihood systems and the conservation of the natural resources should be developed and implemented.

The recommended options should be, but are not limited to:

- Develop policies and strategies to enhance the role of forests and other wooded lands in:
  - i- controlling wind and water erosion;
  - ii- sand dune fixation;
  - iii- rehabilitation of degraded lands;
  - iv- conservation of soil and water resources;
- Promote expansion of an appropriate plant cover , to increase contribution to land conservation and erosion control, with special emphasis on watershed management and infrastructure protection
- Promote and develop with appropriate establishment techniques green-belts, shelterbelts and windbreaks and manage them in a sustainable manner ensuring their ecological and social viability;
- Implement water harvesting techniques and alternative water resources management to develop forest and tree cover, taking into account the integrated management and conservation approaches to watershed resources, safeguarding their natural characteristics.

6. ASSESSING, RECOGNIZING AND EXPANDING THE SOCIAL AND ECONOMICAL ROLES AND CONTRIBUTIONS OF FORESTS AND OTHER WOODED LANDS

The social and economic roles and contribution of forests and other wooded lands to the livelihood of local communities must be recognized, assessed and the conditions for local people to fully benefit from the whole range of opportunities they offer should be created.

The recommended options should be, but are not limited to:

- Assess, evaluate and document the environmental, economic and social contribution of forests and tree resources at various levels of local, national and regional/ international economies;
- Build national capacities to that end;
- Valorize forest products and services, especially NWFP and ecotourism, in order to increase rural income and improve livelihood systems;

- Create an enabling environment and appropriate conditions to encourage private sector investment and involvement;
- Promote involvement of and partnership with stakeholders, CBOs, NGOs and local community groups with particular emphasis on pastoral communities;
- Identify, consult and involve traditional leaders in all issues related to management, conservation and development of local forest and range resources;
- Assess and incorporate traditional knowledge and practices such as "Hima" systems in the management of dryland forests and wooded lands
- Contribute to the protection of intellectual property rights of local and traditional communities especially regarding their knowledge, practices and uses of local natural products, including culinary, aromatic and medicinal plants;
- Secure gender balance and promote the role of women in management of forests, range and tree resources;

Box 7. HIMA PRACTICES AND FORESTRY

Natural regeneration of forests and woody/tree formations is a well accepted technique and is resorted to when the natural potential of the land is still considerable and may express itself when the resource is left alone. Seeds and live vegetal parts (roots to sprout, twigs to layer, long resisting seed stocks in the soil) will reproduce plant formations. Under these circumstances deliberate land management can be effected by medium to long time preservation to obtain regeneration. Many traditional practices use this possibility to regenerate or rehabilitate forests, grazing lands and other plant covered expanses.

In the Near East, these practices have been done by human groups, the tribes and their authorities. The most known practice is the Hima by which Sheikh and Ulema, decide to put an area under protection status that every member of the tribe must respect. As in many regions these protection media have various characteristics including:

- The overall objective of the operation: it is more often to rehabilitate an area or increase a resource for its better use;
- The object of the protection: it may concern i) pastures when a part of the grassland is put under total prohibition; ii) trees when some categories of trees or shrubs are completely protected for a preset duration; iii) areas with water resources put under conservation and for the protection of water availability; iv) a set of wildlife species whose hunting is prohibited. These are examples of objectives of Hima approaches;
- The duration of the prohibition is a function of the objective to attain and the reaction of protected living communities to reach the state of the resource aimed at;
- The beneficiaries of the operation are usually members of the communities involved;
- The quasi religious force of Hima prescriptions.

Forestry practices would largely benefit from those traditional Hima practices. Assisted regeneration is definitely a technique that calls for the same approaches of Hima when it relates to regenerating the woody and grass plant cover for forestry and animal husbandry. The present guidelines recommend that foresters carefully identify Hima practices and blend their management approaches with them in cooperation with local traditional and religious authorities.

Box 8. SHEIKHATS AND OTHER TRADITIONAL AUTHORITIES AND THEIR ROLE IN

NATURAL RESOURCES MANAGEMENT

Societies have evolved and prospered with the resources available in their environment. They have developed coping mechanisms to use, protect and develop these resources. Through these processes of trials and errors a number of traditional practices have emerged and lasted, a matter that indicates their appropriateness and the wisdom in maintaining and incorporating them in modern systems.

Also, those societies have developed a number of traditional patterns of land use and ownership with practices accompanying these patterns inscribed in unwritten laws. A number of these practices should be blended with new conservation and utilization systems for land, water and plant resources. The Sheikhs, traditional rulers of local communities with vested authorities in settling disputes relating to resource utilization, are among the most evident guardians of traditional values and practices. In many a country, the abandonment of Sheikhs' involvement for totally new supposedly modern legislation and regulations has failed. Some countries in the Middle East have revised such exclusive approaches and tried through law revision to resort back to traditional authorities whose grip and influence in societies have remained strong and effective. Resource management approaches which have utterly ignored their existence and potential for assistance have often failed.

Among the many systems in which Sheikhs have had knowledge, authority and audience are the management of land and water resources, the use and management of rangelands, the utilization and management of forest and tree resources; the demarcation of tribal areas and minimisation of conflicts. These knowledge, experience and authority are essential for present approaches to resource management and should be recycled in many ways among which:

- The explanation and incorporation of positive traditional customs in present local practices;
- The acceptation of land distribution which includes new forest reserves, protected areas, restrictions imposed by new land resources management approaches;
- Their assistance in securing sustainability to new practices transferred through new training and extension programmes;
- Helping understand and promote support to linkages between traditional culture and expertise with new management approaches.

7. STRENGTHENING AND UPDATING THE LEGAL, INSTITUTIONAL AND POLICY FOUNDATION OF THE MANAGEMENT OF RANGE, FORESTS AND OTHER WOODED LANDS

Governments should create an enabling environment for the overall institutional development of range and forestry, with updated legal, educational, research and institutional set-up.

The recommended options should be, but are not limited to:

- Develop and implement national policies, strategies, programs and action plans for sustainable management of forest, range and tree resources including wildlife resources;
- Mainstream national forestry plans and programs into wider national development policies, plans and programs (National Forest Programme

(nfp));

- Assess and strengthen forest and range institutions to increase their effectiveness in managing forest, tree and range resources;
- Review and update status of conservation of wildlife and protected areas, and strengthen relevant institutions for their conservation and expansion;
- Develop, update, adapt and implement the "forest law enforcement and governance (FLEG) principles;
- Identify and take stock of customary laws and incorporate them in policy development and management initiatives on forest, range and tree resources;
- Develop and strengthen forestry education and training institutions and evolve, update, and adapt their relevant curricula;
- Promote decentralization and empowerment of local communities and improve participatory approaches in management and use of forest, range and tree resources;
- Strengthen research and academic institutions for developing and applying research in forest and range related issues;
- enhance and facilitate effective application of measures relevant to forests in international conventions and frameworks, and incorporate them in the management, conservation and development of forest, range and tree resources;
- Promote coordination and cooperation among local, national, regional and international institutions concerned with forests, range and other wooded lands.

8. ASSESSING RISK AND VULNERABILITY LINKED TO CLIMATE CHANGE, AND ENHANCING THE POTENTIAL OF FORESTS AND OTHER WOODED LANDS FOR MITIGATION AND ADAPTATION TO CLIMATE CHANGE IMPACTS.

The potential for dryland forests in adaptation to and mitigation of climate change impacts deserves higher attention at national and international levels. It is therefore essential that forestry and other related institutions be prepared and fully engaged in national and international actions regarding assessment of vulnerability and preparation of action plans for adaptation programmes.

- Encourage development of national strategies to mainstream the emerging climate change issues within national forest programmes (nfps) and other relevant programmes.
- Strengthen capacities in areas such as forest inventories, monitoring carbon stocks, development of forest carbon projects, and accessing carbon markets.
- Strengthen capacities in monitoring impacts of climate change on forest and range ecosystems.
- Raise awareness of, and strengthen collaboration and information sharing on issues and practices relating to forests and climate change mitigation and adaptation.
- capitalize on economic, social and environmental benefits when developing climate change mitigation and adaptation strategies in forestry
- Support and enhance research including programmes for selection and genetic improvement of tree and shrubs species, both native and introduced, for adaptation to projected conditions induced by climate change.
- Promote expansion of appropriate plant cover in order to sustain soil fertility and carbon sequestration processes;

Urban tree planting Cairo Egypt (HOA)

Tree planting for Environmental rehabilitation Cyprus (HOA)

Watershed Management Turkey (HOA)

Watershed Management Nile Sudan

GLOSSARY

(Definitions marked with an asterisk (*) have been taken from the "Global Forest Resources Assessment 2005" (FRA 2005) (www.fao.org/forestry/site/fra2005-terms).

Definitions market with an asterisk ** have been taken from "A vocabulary of contemporary forestry terms", Hassan Osman Abdel Nour, El-Maarefa Printing House, Cairo, Egypt 2006.

The remaining definitions have been taken from the Voluntary guidelines on: Responsible management of planted forests)

Agro-sylvo-pastoral system**

Land-use system in which woody perennials are used on the same land as agricultural crops and animals, in same form of spatial arrangement or temporal sequence

Alien species**

An alien species is a species, sub-species or member of a lower taxon that has been introduced outside its normal past and present distribution: the definition includes the gametes, seeds, eggs, propagules, or any other part of such species that might survive and subsequently reproduce.

Afforestation*

Establishment of forest plantations on land that, until then, was not classified

as forest. Implies a transformation from non-forest to forest.

Arab Maghreb Union (UMA)**

Established in 1989, UMA is a sub-regional intergovernmental organization that, amongst other attributions, assists North African countries to implement the Convention on Desertification.

Biological diversity * (also Biodiversity)

The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (from the Convention on Biological Diversity, art 2: www.biodiv.org/convention/articles.asp?lg=0&a=cbd-02).

Biological resources **

Includes genetic resources, organisms or part thereof, populations, or any other biotic component of ecosystem with actual or potential use or value for humanity.

Biofuel **

Fuel of biological origin, which recently was either alive (phytomass) or came from living organisms (dung, biogas).

Carbon sequestration

The uptake and storage of carbon. Forests, trees and plants absorb carbon dioxide, release the oxygen and store the carbon.

Carbon sink

Forest and other ecosystems that absorb carbon, thereby removing it from the atmosphere and offsetting CO2 emissions. The Kyoto Protocol allows certain human-induced sink activities undertaken since 1990 to be counted towards Annex I Parties' emission targets.

Center for International Forestry Research (CIFOR)**

Established in 1993 as part of the Consultative Group on International Agricultural Research (CGIAR) in response to global concerns about social, environmental and economic consequences of forest loss and degradation.

Clean Development Mechanism (CDM)

The Clean Development Mechanism (CDM) is one of the flexible mechanisms of the Kyoto Protocol designed to make it easier and cheaper for industrialized countries to meet the greenhouse gas emission reduction targets that they agreed to under the protocol. Under the CDM, an industrialized country with a greenhouse gas reduction target can invest in a project in a developing country without a target and claim credit for the emissions that the project achieves.

Collaborative Partnership for Forest (CPF)**

CPF was launched in 2001 to enhance cooperation and coordination among CPF members.

Deforestation*

The conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10 percent threshold.

Degraded forest**

Is a secondary forest that has lost, through human activities, the structure, function, species composition or productivity normally associated with a natural forest type expected on that site.

Desertification**

Land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.

Drought**

The naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems.

Disturbances* affecting forest health and vitality

A disturbance is defined as an environmental fluctuation and destructive event that disturbs forest health, structure and/or change resources or physical environment at any given spatial or temporal scale. Disturbances that affect health and vitality include biotic agents such as insects and diseases and abiotic agents such as fire, pollution and extreme weather conditions (White and Pickett, 1985; Lindgren and Lewis, 1997, also available at www.mcgregor.bc.ca/publications/InteractionsWithInsectsAndPathogens.pdf).

Ecosystem**

A dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit.

Employment*

Any type of work performed or services rendered under a contract of hire, written or oral, in exchange for wage or salary, in cash or in kind. (Based on definitions by ILO and the Employment Security Commission.) Employment may be related to the primary production of goods, or to the provision of services.

ILO Core Labour Standards include the following conventions:

- Convention 29 on Forced Labour, adopted in 1929 and Convention 105 on Abolition of Forced Labour, adopted in 1957.
- Convention 87 on Freedom of Association and Protection of the Right to Organise, adopted in 1948.
- Convention 98 on the Right to Organise and Collective Bargaining, adopted in 1949.
- Convention 100 on Equal Remuneration, adopted in 1951, and Convention 111 on Discrimination (Employment and Occupation), adopted in 1958.
- Convention 131 on Minimum Wage Fixing, adopted in 1970.
- Convention 138 on Minimum Age, adopted in 1973, and Convention 182 on Worst Forms of Child Labour, adopted in 1999.

- Convention 142 on Human Resources Development, adopted in 1975.
- Convention 155 on Occupational Safety and Health, adopted in 1981, and Convention 161 on Occupational Health Services, adopted in 1985.

Endemic species**

An endemic species is a native species restricted to a particular geographic region owing to factors such as isolation or in response to soil or climatic conditions.

Eutrophication

A process by which bodies of water become highly charged with nutrients, leading to massive growth in primary productivity, which may result in the growth of algae ('algal blooms'), leading to reductions in dissolved oxygen and the death of fish and other aquatic life.

Forest*

Land spanning more than 0.5 hectares (ha) with trees higher than 5 metres (m) and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.

- Forest is determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 m in situ. Areas under reforestation that have not yet reached but are expected to reach a canopy cover of 10 percent and a tree height of 5 m are included, as are temporarily unstocked areas, resulting from human intervention or natural causes, which are expected to regenerate.
- Includes areas with bamboo and palms provided that height and canopy cover criteria are met.
- Includes forest roads, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of specific scientific, historical, cultural or spiritual interest.

- Includes windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 ha and width of more than 20 m.
- Includes plantations primarily used for forestry or protective purposes, such as rubberwood plantations and cork oak stands.
- Excludes tree stands in agricultural production systems, for example in fruit plantations and agroforestry systems. The term also excludes trees in urban parks and gardens.

Forest certification

A procedure to assess the quality of forest management in relation to a forest management standard. Forest certification is designed to send a market signal to buyers that the products they purchase are derived from forests managed to particular environmental and social standards.

Forest degradation**

Changes within the forest which negatively affect the structure or functions of the stand or site, and thereby lowers the capacity to supply products and/or services.

Forest management*

The processes of planning and implementing practices for the stewardship and use of forests and other wooded land aimed at achieving specific environmental, economic, social and /or cultural objectives. Includes management at all scales such as normative, strategic, tactical and operational level management.

Intensive forest management*

A regime of forest management under which silvicultural practices define the structure and composition of forest stands. A formal or informal forest management plan exists. A forest is not under intensive management, if mainly natural ecological processes define the structure and composition of stands.

Forest rehabilitation**

A management strategy applied in degraded forest lands that aim at re-establishing site productivity and protective functions and many of the ecological services provided by a functional forest or woodland ecosystem.

Forest resources*

For the purposes of the global forest resources assessments, forest resources include those found in forests and other wooded land and as trees outside forests.

Forestry Outlook Study**

In an" outlook study", FAO and its member countries identify a range of issues, possible choices and options for action that could assist countries in achieving their goals for forests and the forestry sector.

Function*

The designated function refers to the purpose assigned to a piece of land, either by legal prescriptions or by decision of the landowner/manager. It applies to land classified as 'Forest' and as 'Other wooded land'.

Primary function*

A designated function is considered to be primary when it is significantly more important than other functions. This includes areas that are legally or voluntarily set aside for specific purposes.

Secondary function* Other functions.

Genetic material**

Any material of plant, animal, microbial or other origin containing functional units' heredity.

Genetic resources**

Genetic material of actual or potential value.

Habitat**

The place or type of site where an organism or population naturally occurs.

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 of heads of the tribe.

Introduced species* – see Species

Low forest cover countries LFCCs The term "LOW FOREST COVER COUNTRY" (LFCC) has not yet been formally defined, but commonly refers to countries with less than 10 percent forest cover. In 2000, 71 countries qualified as LFCCs, with a total land area of about 4 billion hectares and forest cover of only 140 million hectares (3.5 percent). In these countries natural forests accounted for 52 percent of forests, and planted forests for 48 percent.

Mangroves**

Mangroves are the characteristic littoral plant formations of tropical and subtropical sheltered coastlines. They are variously described as coastal woodland, tidal forest and mangrove forest.

Managed forest/other wooded land*

Forest and other wooded land that is managed in accordance with a formal or informal plan applied regularly over a sufficiently long period (five years or more).

Native species* – see Species

Natural forest*

A forest composed of indigenous trees, not planted and not classified as a forest plantation.

Modified natural forest/other wooded land*

Forest/other wooded land of naturally regenerated native species where there are clearly visible indications of human activities.

- Includes, but is not limited to: selectively logged-over areas, areas naturally regenerating following agricultural land use, areas recovering from human-induced fires, etc.
- Includes areas where it is not possible to distinguish whether the regeneration has been natural or assisted.

Primary forest/other wooded land*

Forest/other wooded land of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed. They include areas where collection of non-wood forest products occurs, provided the human impact is small. Some trees may have been removed.

Semi-natural forest/other wooded land*

Forest/other wooded land of native species, established through planting, seeding or assisted natural regeneration:

- Includes areas under intensive management where native species are used and deliberate efforts are made to increase/optimize the proportion of desirable species, thus leading to changes in the structure and composition of the forest.
- Naturally regenerated trees from other species than those planted/seeded may be present.
- May include areas with naturally regenerated trees of introduced species.

- Includes areas under intensive management where deliberate efforts, such as thinning or fertilizing, are made to improve or optimize desirable functions of the forest. These efforts may lead to changes in the structure and composition of the forest.

Near East Forestry Commission (NEFC)**

Is a forum for member countries to exchange views and experience and to formulate recommendations for implementation at national and regional levels in relation to forests, trees and forest products in the Near East.

Non-wood forest product (NWFP)*

A product of biological origin other than wood derived from forests, other wooded land and trees outside forests (FAO NWFP Web site: www.fao.org/forestry/site/6388/en).

Other wooded land*

Land not classified as 'Forest', spanning more than 0.5 ha; with trees higher than 5 metres and a canopy cover of 5–10 percent, or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.

Plantation forest or forest plantation/other wooded land*

Forest/other wooded land of introduced species and in some cases native species, established through planting or seeding.

- Includes all stands of introduced species established through planting or seeding.
- May include areas of native species characterized by few species, even spacing and/or even-aged stands.
- Plantation forest is a subset of planted forest.
- Productive plantation* (in forest/other wooded land)
- Forest/other wooded land of introduced species and in some cases native species, established through planting or seeding mainly for production of wood or non-wood goods.

- Includes all stands of introduced species established for production of wood or non-wood goods.
- May include areas of native species characterized by few species, straight tree lines and/or even-aged stands.

Protective plantation* (in forest/other wooded land)

Forest/other wooded land of native or introduced species, established through planting or seeding mainly for provision of services.

- Includes all stands of introduced species established for provision of environmental services, such as soil and water protection, pest control and conservation of habitats to biological diversity.
- Includes areas of native species characterized by few species, straight tree lines and even-aged stands.

Planted forest/other wooded land*

Forest/other wooded land in which trees have been established through planting or seeding. Includes all stands established through planting or seeding of both native and introduced species.

Purpose:

Multiple purpose*

Forest/other wooded land designated to any combination of production of goods, protection of soil and water, conservation of biodiversity and provision of socio-cultural services and where none of these alone can be considered as being significantly more important than the others.

Production*

Forest/other wooded land designated for production and extraction of forest goods, including both wood and non-wood forest products.

Protection of soil and water*

Forest/other wooded land designated for protection of soil and water.

Social services*

Forest/other wooded land designated for the provision of social services. These services may include recreation, tourism, education and/or conservation of cultural/spiritual and religious sites.

Reforestation*

Establishment of forest plantations on temporarily unstocked lands that are considered as forest.

Regeneration

Artificial regeneration

Forests established by artificial means on land that carried forest within the previous 50 years or within living memory and involved the renewal of what was essentially the same crop as before.

Natural regeneration (with assistance)

Forests established by natural regeneration, with deliberate, human silvicultural assistance, including the provision of seed or vegetative reproductive material.

Natural regeneration (without assistance)

Forests established by natural regeneration without deliberate, human assistance, including virgin forests and those regenerated by natural means.

Secondary forest*

Forest regenerated largely through natural processes after significant human or natural disturbance of the original forest vegetation.

- The disturbance may have occurred at a single point in time or over an extended period.
- The forest may display significant differences in structure and/or canopy species composition in relation to nearby primary forest on similar sites.

Species

Introduced species*

A species introduced outside of its normal past and current distribution.

Note: Its synonyms are 'alien species' and 'exotic species'.

Native species*

A native species is one which naturally exists at a given location or in a particular ecosystem, i.e. it has not been moved there by humans (CBD Web site: www.biodiv.org/programmes/areas/forest/definitions.asp). The term 'native species' is synonymous with 'indigenous species'.

Silviculture*

The art and science of controlling the establishment, growth, composition, health and quality of forest and woodlands to meet the targeted diverse needs and values of landowners and society on a sustainable basis (see the Web site of the International Union of Forest Research Organizations: www.iufro.org/).

Tree*

A woody perennial with a single main stem or, in the case of coppice, with several stems, having a more or less definite crown. Includes bamboos, palms and other woody plants meeting the above criteria.

Trees outside forests (TOFs)

Trees outside forests include all trees found outside forests and outside other wooded lands:

- stands smaller than 0.5 ha;
- tree cover in agricultural land, e.g. agroforestry systems, home gardens, orchards;
- trees in urban environments;
- along roads and scattered in the landscape.

BIBLIOGRAPHY AND SUGGESTED REFERENCES

General - different authors

1. 1. Abdel Nour, H.O. 1999. Gum Arabic in Sudan: production and socio-economic aspects (English), in: Proceedings; International Expert Meeting on Medicinal, Culinary and Aromatic Plants in the Near East, Cairo (Egypt), 19-21 May 1997 / FAO, Rome (Italy). Forestry Dept.; FAO, Cairo (Egypt). Regional Office for the Near East, p. 66-73.
2. Abu Setta, M., 1996. Case study on silviculture and management of irrigated forest plantations in Jordan (English) / FAO, Rome (Italy). Forestry Dept.; FAO, Cairo (Egypt). Regional Office for the Near East, 39 p.
3. ADEEL, Zafar ...et al., 2005. Ecosystems and human well-being: desertification synthesis. - Washington, D.C.: World Resources Institute, - iv, 26 p.; ill. , graphs, maps, tables.ISBN 1-56973-590-5
4. Advisory Committee on Technology Innovation (ad hoc panel), 1980. Firewood Crop, shrubs and trees species for energy production, Report. Washington D.C.: National Academy of Science.
5. Akyol, H., Rivero, S., Teherani, M., (ed.) Trossero, M.A., 2000. The role of wood energy in the Near East; Wood Energy Today for Tomorrow (WETT). Regional studies. Working paper 2 (English) / FAO, Rome (Italy). Forestry Dept., 44 p.
6. ALSHARHAN, A. S. et al (ed.). 2003. Desertification in the third millennium: Proceedings of an international conference, Dubai, 12-15 February 2000. - Liss: Balkema, - x, 489 p.: ill. ISBN: 9058095711
7. Anderson, D. & Baltimore, M.D., 1987. Economics of afforestation: a case study in Africa. John Hopkins University Press.
8. Armitage F.B.., 1986. Foresterie irriguée en pays arides et semi arides: une synthèse, IDRC, Ottawa (Canada), 192p.
9. ARNALDS, Olafur and ARCHER, Steve, 2000. Rangeland desertification. Dordrecht: Kluwer Academic Publishers, - 209 p. ill. ISBN: 0792360710
10. A. Y. Goor, C. W. BARNEY, 1968: Forest Tree Planting in Arid Zones
11. Aronson C. et al. 1993. Restoration and rehabilitation of degraded ecosystems in arid and semi-arid lands. A view from the south. Restoration Ecology, 1:8-17.

12. BAKER, Lucy, 2001, Life in the deserts. Chicago: World Book, 2001.- 31 p.ISBN: 071665220X.

13. BANTING, Erinn, 2006. Deserts. New York: Weigl Publishers, 2006 ISBN: 1590363442

14. BARNES, Julia, 2004. 101 facts about deserts 4. Milwaukee: Gareth Stevens Pub., 32 p. ISBN: 0836837061

15. Bainbridge, D.A., 2001. "Burried clay pot irrigation: a little known but very efficient traditional method of irrigation," Agricultural Water Management 48: 79– 88.

16. Belal, A.E. and Springuel, I., 1996. "Economic Value of Plant Diversity in Arid Environments, Nature & Resources 32 (1): 33–39.

17. Blay, D., Bonkoungou, E., Chamshama, S.A.O., Chikamai, B., Wood, P., Yapi, A.M., (ed.), 2004.Rehabilitation of degraded lands in Sub-Saharan Africa: lessons learned from selected case studies (English) / Forestry Research Network for Sub-Saharan Africa, Nairobi (Kenya); International Union of Forestry Research Organizations, Vienna (Austria). Special Programme for Developing Countries, 99 p.

18. BOIKO N.P., MOLCHANOVA A.I., 1968. Protective afforestation on irrigated and dry lands in Middle Asia. [Protective afforestation on irrigated and dry lands in Middle Asia.]. (Russian) State Committee Of Forestry At the Council of Ministers, Puschkino, USSR in Vol of Lectures Presented At the Group Study Tour & Seminar on the Questions of Technology and Mechanization of Forestry Operations and Silviculture – USSR, 17 Sep - 16 Oct 1968 - P. 193-218.

19. Breckle, S.W., Veste M. and Wucherer, W. (Eds), 2001. Sustainable Land Use in Deserts. Springer, Berlin

20. BRIASSOULIS, Helen (ed.), 2005.Policy integration for complex environmental problems: the example of Mediterranean desertification. - Aldershot: Ashgate, - 371 p. ISBN: 0754642437.

21. Brooks,D., 1993. Beyond Catch Phrases: What Does Sustainable Development Really Mean? Arid Lands V. 33:3-5.

22. Carlson, L.W., (ed.) Shea, K.R., (comp.) 1986. Increasing productivity of multipurpose lands; (Poceedings) (English); International Union of Forestry Research Organizations. Research Planning Workshop for Africa, Sahelian and North Sudanian Zones, Nairobi (Kenya), 9-15 Jan 1986 / (Vienna) (Austria), (IUFRO), 333 p.

23. Cavalcaselle, B., 1998. Conflict management and community forestry in the Near East region: two case studies from Syria and Jordan (English), In: *Integrating conflict management considerations into national policy frameworks*. Proceedings of a Satellite Meeting to the XI World Forestry Congress, 10-13 October 1997, Antalya, Turkey; Forests, Trees and People Programme. Conflict management series / FAO, Rome (Italy). Forestry Policy and Planning Div., p. 209-228.

24. Cloudsley-Thompson J.L., 1977. Man and Biology of Arid Zones. Edwards Arnold Ltd pp182.

25. Cloudsley-Thompson J.L. and Duffey E., 1977. Deserts and grasslands. Doubleday and Company Inc, New York

26. Cloudsley-Thompson J.L, 1984. Sahara Desert. Publisher: Oxford; New York: Published in collaboration with International Union for Conservation of Nature and Natural Resources by Pergamon Press.

27. Conacher, Arthur J. (ed.), 2001. Land degradation: papers selected from contributions to the sixth meeting of the International Geographical Union's Commission on land degradation and desertification, - Dordrecht: Kluwer Academic Pub. 390 p. ISBN: 0792367707.

28. Dietz, A.J., R. Ruben & A. Verhagen, (eds.) (2004). the Impact of Climate Change on Drylands, with a Focus on West Africa. Dordrecht/Boston/ London: Kluwer Academic Publishers. Environment and Policy Series, Vol. 39 (465 & xviii p.)

29. Dixon, J.A., James, D.E. and Sherman P.B. 1989. The economics of Dryland Management. EAETHSCAN Publications LTD, London

30. Dixon, J.A., James, D.E. and Sherman P.B. (Eds). 1990. Dryland management: economic case studies. EAETHSCAN Publications LTD, London

31. Dogru, M., 1996. Review of the criteria and indicators for sustainable forest management in the Northern sub-region countries of the Near East (Turkey, Iran, Syria and Lebanon) (English) In: Report *; FAO/ UNEP Expert Meeting on Criteria and Indicators for Sustainable Forest Management in the Near East*, Cairo (Egypt), 15-17 Oct 1996 / FAO, Cairo (Egypt). Regional Office for the Near East; UNEP, Nairobi (Kenya), Donmez, R.E., / FAO, 1994. Development of community forestry through intensive participatory approach in Syria (English) FAO, Rome (Italy). Forestry Dept., 43 p.

32. Dregne, H.E. (ed) 1970. Arid lands in transition. Publ. American Association for the Advancement of Science. Washington, D.C.

33. Dregne, H.E. 1983. Desertification of Arid Lands. Harwood Academic Publishers Chur, Switzerland; New York.

34. Dregne, H.E. (ed.) 1992. Degradation & Restoration of Arid lands. International Center for Arid and Semiarid Lands Studies, Texas Tech University.

35. El Hennawy, H.M., 1999. Medicinal, aromatic and toxic plants in Arab countries (English), In: Proceedings *; International Expert Meeting on Medicinal, Culinary and Aromatic Plants in the Near East*, Cairo (Egypt), 19-21 May 1997 / FAO, Rome (Italy). Forestry Dept.; FAO, Cairo (Egypt). Regional Office for the Near East, p. 74-77.

36. Evans D.D. and J.L. Thames. Dowden, Hutchinson & Ross, (eds), 1981. Water in Desert Ecosystems**,** Inc. Pennsylvania 280pp

37. le Houerou, H.N., 1978. The role of shrubs and trees in the management of natural grazing lands (with particular reference to protein production) (English); *World Forestry Congress*, 8, Jakarta (Indonesia), 16 Oct 1978 / FAO, Rome (Italy), 34 p.

38. El-Lakany, M.H., 1997. Criteria and indicators for sustainable forest management in the Near East (English) In: *Forestry for sustainable development: towards the 21st century. Proceedings*; v. 1(A): Forest and tree resources.- v. 2(B): Forests, biological diversity and the maintenance of the natural heritage. 2(C): Protective and environmental functions of forests.- v. 3(D): Productive functions of forests.- v. 4(E): The economic contribution of forestry to sustainable development.- v. 5(F): Social dimensions of forestry's contribution to sustainable development. 5(G): Policies, institutions and means for sustainable forestry development.- v. 6(H): Ecoregional review.- v. 7: Main report.- v. 8: Additional contributions *; World Forestry Congress*, 11, Antalya (Turkey), 13-22 Oct 1997 Juslin, H. Lintu, L. / Ankara (Turkey), (npub) , v. 6 p.107-114.

39. Evenary, M., Noy-Meir and Goodall D.W. (Eds). 1985. Hot Deserts and Arid Shrublands A. *Ecosystems of the World 12A*. EISEVIER. Amsterdam, Oxford, New York, Tokyo.

40. Evenary, M., Noy-Meir and Goodall D.W. (Eds). 1986. Hot Deserts and Arid Shrublands B. *Ecosystems of the World 12B*. EISEVIER. Amsterdam, Oxford, New York, Tokyo.

41. FAYE, Bernard and ESENOV, Palmated (ed.) 2005.Desertification combat and food safety: the added value of camel producers .- Amsterdam: IOS Press, 2005 .- ix, 225 p. : ill ISBN: 1586034731

42. FRATKIN, Elliot M. 2003. Ariaal pastoralists of Kenya: studying pastoralism, drought, and development in Africa's arid lands (2nd ed.) .- Boston: Allyn & Bacon, 144 p.ISBN: 0205391427

43. Fonseca, H., ed. 2005. Indigenous peoples: their forests, struggles and rights. Montevideo, Uruguay, World Rainforest Movement.

44. GADAMU, Fecadu, 2001. Arid land and the role of pastoral nomads in the economic, and political integration of the Horn of Africa, with particular reference to Ethiopia (Occasional papers series),.- Addis Ababa: Ethiopian International Institute for Peace and Development, - 14 p. ASIN: B0006E87ZU

45. Gataulina, E., Waggener, T.R., 1997. The forest sector in the Russian Far East: status and near-term development (English) In: CINTRAFOR *Working Paper* (USA), no. 63 / Washington Univ., Seattle (USA). Center for International Trade in Forest Products, 78 p.

46. GEESON, Nichola; THORNES, John B. and BRANDT, C. Jane (ed.) 2002. Mediterranean desertification: a mosaic of processes and responses 6. - Chichester: John Wiley & Sons Inc. 2002. - 440 p. ill. ISBN: 0470844485.

47. GEIST, Helmut, 2004**.** The causes and progression of desertification .-Aldershot: Ashgate Pub Co. -276 p.ISBN: 0754643239

48. Ghebalou, / FAO, 1992. Development of Forest Resources for Environmental Protection and Food Security in Arid and Semi-arid areas of the Near East and North Africa. Sub-regional report for Morocco - Algeria - Tunisia (English) FAO, Rome (Italy). Forestry Dept.

49. Gillis M. & Repetto, R. 1990. The new forestry, an ecosystem approach to land management. *BioScience*, 40(8): 558–562.

50. GLANTZ, Michael H.; GAO, Wei and HONDA, Yoshiaki (ed.) 2003. Ecosystems dynamics, ecosystem-society interactions, and remote sensing applications for semi-arid and arid land .- Bellingham : SPIE, - 2 v. (xxvii, 1002 p.) : ill.ISBN: 0819446769**.**

51. GLOBAL ENVIRONMENT FACILITY, UNITED NATIONS ENVIRONMENT PROGRAMME**,** 2002. Land degradation assessment in drylands - LADA Project: meeting report, 23-25 January 2002 .- Nairobi: UNEP, 2002 .- 36 p. ISBN: 9251047979

52. Goodall D.W., **Perry** R. A. and **Howes**K.M.W. 1981. Arid-land ecosystems : structure, functioning and management**.** Vol.2 Cambridge University Press.

53. Goldammer, J.G. & de Ronde, C., eds. 2004. Wildland fire management hand book for sub-Sahara Africa. Freiburg, Germany, Global Fire Management Center; Cape Town, South Africa, Oneworldbooks.

54. Hall, J.B. 1992. Ecology of a key African multipurpose tree species, Balanites aegyptiaca (Balanitaceae): the state-of-knowledge, *Forest Ecology and Management* 50: 1–30.

55. Heywood, V., 1999. Plant resources and their diversity in the Near East (English) In: Proceedings; *International Expert Meeting on Medicinal, Culinary and Aromatic Plants in the Near East*, Cairo (Egypt), 19-21 May 1997 / FAO, Rome (Italy). Forestry Dept.; FAO, Cairo (Egypt). Regional Office for the Near East, p. 8-21.

56. Higman S., Mayers J., Judd N. & Nussbaum, R. 2005. Sustainable forestry handbook (2nd edn.). London, Earthscan.

57. Hills,E.S.(ed.), 1966. Arid lands**.** . Methuen, London, and UNESCO, Paris.

58. Hodge, C. (ed.), 1963. Aridity and Man. Publication N 74. American Association for the Advancement of Science. Washington, D.C.

59. Karmouni, A., 1996. Formulating criteria and indicators for sustainable forest management in North Africa sub-region countries (English) In: Report *; FAO/UNEP Expert Meeting on Criteria and Indicators for Sustainable Forest Management in the Near East*, Cairo (Egypt), 15-17 Oct 1996 / FAO, Cairo (Egypt). Regional Office for the Near East; UNEP, Nairobi (Kenya), p. 2-24.

60. Krzywinski K.and R. H. Pierce, eds., 2001. Deserting the Desert. Norway: Alvheim & Eide Akademisk Forlag.

61. KUROKAWA, Kosuke (ed.) 2003. Energy from the desert: feasibility of very large scale photovoltaic power generation. - London: James & James (Science Publishers), 2003. - xi, 195 p. ISBN: 1902916417.

62. IUCN REGIONAL OFFICE FOR WEST AFRICA, 2004. Enhancing social sustainability in activities to combat desertification: a manual for reflection.-Gland, Switzerland; Cambridge, UK: IUCN, 2004. - 136 p ISBN: 2831707692.

63. JHA, V. C. (ed.) 2003. Land degradation and desertification. Jaipur : Rawat Publications, - 405 p. ill. ISBN: 8170338255 7.

64. LAMBERT, John D.H.; RYDEN, Per A. and ESIKURI, Enos E., 2005. Capitalizing on the bio-economic value of multi-purpose medicinal plants for the rehabilitation of drylands in Sub-Saharan Africa. Nairobi: Washington, D.C.: Global Environment Facility (GEF) , World Bank (IBRD) ,.- 51 p. ; ill., tables

65. Malagnoux, Michel; E-H Sène et N. Atzmon in Unasylva Vol. 58 N° 229 : Les Forêts, les Arbres et l'Eau dans les Terres arides : un équilibre précaire

66. MARTIN, Michael, 2004. Deserts of the earth: extraordinary images of extreme environments. New York: Thames & Hudson, 2004. - 371 p.: ill. ISBN: 0500511942

67. Michaelides, E.D., 1984. Wood energy in the Near East and North Africa (fuelwood, charcoal) (English), / FAO, Rome (Italy). Forestry Dept., 84 p.

68. Millington, A.C. and Rye K., (Eds), 1994. Environmental Change in Drylands. Biogeographical and Geomorphological perspectives. John Wiley & Sons, Chichester – New York – Brisbane – Toronto – Singapore.

69. Naimat, A., / FAO, 1994. Use of sewage water for irrigating forest nursery and agroforestry plantations in Wadi Shuei***b*** (Arabic, English) FAO, Rome (Italy). Forestry Dept.; Ministry of Agriculture, Amman (Jordan). Forestry Dept., 66 p.

70. National Academy of Sciences. 1979. Tropical Legumes: Resources for the future. National Academy of Sciences Washington, D.C.

71. National Academy of Sciences, 1980. *Firewood Crops. Shrubs and Trees Species for Energy Production*. National Academy of Science, Washington D.C.

72. National Academy of Sciences, 2001. More water for arid lands: promising technologies and research opportunities. Honolulu: University Press of the Pacific ISBN: 0898755298.

73. Narain Pratap, Kathju S., Kar Amal, Singh M.P. and Praveen-Kumar (eds.), 2003. Human impact on desert environment. Jodhpur: Arid Zone Research Association of India, 2003. - xii, 629 p. : ill. ISBN: 8172333501

74. NIASSE, Madiodio; AFOUDA, Abel and AMANI, Abou (ed.), 2004. Reducing West Africa's vulnerability to climate impacts on water resources, wetlands, and desertification: elements for a regional strategy for preparedness and adoption.. Gland, Switzerland : IUCN--the World Conservation Union, 2004 .- 66 p.ISBN: 283170782X

75. Nelson R.., 1988. Dryland management. The desertification problem. World Bank Technical paper, 116:39 p.

76. Odera, J., 1996. L'etat de degradation actuel des ecosystemes fragiles dans les zones seches et le role de la foresterie dans leur restauration [The present state of degradation of fragile ecosystems in dry lands and the role of forestry in their restoration]. (French) In**:** (Actes) *; Reunion d'Experts sur la Rehabilitation de Ecosystemes Forestiers Degrades*, Lisbon (Portugal), 24-28 Jun 1996 / FAO, Rome (Italy). Div. des Ressources Forestieres; p. 51-69.

77. Office of Technology Assessment, 2004**,** Water-related technologies for sustainable agriculture in arid/semiarid lands: selected foreign experience**.** Honolulu: University Press of the Pacific, .ISBN: 1410218325.

78. de Oliveira, T. Duraiappah, K. and Shepherd, G., 2003. Increasing capabilities through an ecosystem approach for the drylands. *The Global Drylands Imperative* UNEP/UNDP

79. OLDERSHAW, Cally., 2000**.** Deserts and wastelands. Brookfield: Copper Beech Books, 2000. - 32 p.: ill. ISBN: 0761311521.

80. OLDFIELD, Saran**,** 2004. Deserts: the living drylands. Cambridge: MIT Press. - 160 p.: ill. ISBN: 026215112X

81. Omran, A.T., Nour, A., Bouzeid, A., Lahouati, R., Lahoucine, H., / FAO, 1992. Development of Forest Resources for Environmental Protection and Food Security in Arid and Semiarid Areas of the Near East and North Africa. National reports for Egypt, Sudan, Yemen, Tunisia, Algeria and Morocco (Arabic, English) FAO, Rome (Italy). Forestry Dept.; Ministry of Agriculture, Damascus (Syria). Forestry Dept.

82. PASTERNAK, D. and SCHLISSEL Arnold (eds.), 2001**.**Combating desertification with plants. New York: Kluwer Academic/Plenum Publishers, 462 p.: ill. ISBN: 0306466325.

83. PICANO, Felice, 2004. Dryland's end .- New York: Haworth Pr Inc., 2004 .- xv, 525 p. : map ISBN: 1560235209

84. Price, W.C., Rana, N. & Sample, V.A., 2005. Plantations and protected areas in sustainable forestry. Binghampton, NY, Food Products Press.

85. Repetto, R. & Gillis, M., 1988. Public policies and the misuse of forest resources. Washington, DC, Cambridge University Press.

86. Rouchiche, S. and Abid,H., 2002. The role of planted forests and trees outside forests in sustainable forest management. Republic of Tunisia, *Country study report*. FAO and Government of the Republic of Tunisia, Rome.

87. RING, Elizabeth and KUHN, Dwight, 2005. Drylands**.** Chicago: Blackbirch, 2005. - 48 p. ISBN: 1410303209 10.

88. Ros-Tonen M.A. F. and Dietz, T. (eds), 2005. African Forests between Nature and Livelihood Resources. Interdisciplinary Studies in Conservation and Forest Management. *African Studies, Volume 81*, Lampeter (Wales): The Edward Mellen Press

89. ROUND-TURNER, David, 2000. Desertification control bulletin: a bulletin of world events in the control of desertification, restoration and degraded lands and reforestation In: *Desertification Control Bulletin*, no.36, 2000. - Nairobi: United Nations Environmental Programme (UNEP), 2000. - ii, 130 p. : ill. ; maps. ISSN 0379-2455

90. Sabra, A., Walter, S., 2001. Non-wood forest products in the Near East: a regional and national overview**;** *Non-wood forest products programme Working Paper* FOPW/01/2 (English) / FAO, Rome (Italy). Forestry Dept., 127 p.

91. Sahni, K.C., 1968. Important trees of the Northern Sudan. Khartoum: United Nations Development Programme and FAO Project.

92. SANDLER, Michael, 2006. Deserts: surviving in the Sahara. New York: Bearport Pub. - 32 p.: ill. ISBN: 1597160857 5

93. SHACHAK, Moshe James R. Gosz, Stewart T. A. Pickett and Avi Perevolotsky (Eds.). 2004. Biodiversity in drylands: toward a unified framework . Oxford: Oxford University Press, 2004. - xvii, 347 p. : ill. ISBN: 0195139852

94. Sène, El Hadji, in Encyclopedia of Forest Science, Elsevier Academic Press: Silviculture and Management in Arid and Semi-arid Regions.

95. Sivakumar, M.V.K., Zobisch, M.A., Koala S. and Maukonen T. (Eds), 1978. Wind Erosion in Africa and West Asia: Problems and Control Strategies. *Proceedings of the Expert Group Meeting* 22-25 April 1997, Cairo Egypt. ICARDA.

96. Springuel, I. and Mekki, A.M. 1994. Economic value of desert plants: *Acacia* trees in Wadi Allaqi Biosphere Reserve. *Environmental Conservation* 21 (1): 41–48.

97. Stiles D. (Ed) 1994. Listening to the People: Social Aspects of Dry Land Management. *Proceedings of the International Workshop*, Nairobi 14-18 December 1993. Desertification Control Programme Activity Center, UN/UNEP

98. Tellawi, A.M., / FAO, 1993. Role of forestry in food security and environmental protection**;** *The state-of-the-art sub-regional report* (Syria, Jordan and Lebanon) (English), FAO, Rome (Italy). Forestry Dept. , 1993 , 30 p.

99. THOMAS, David; TWYMAN, Chasca and HARRIS, Frances, 2002. Sustainable development in drylands: geographical contributions to a better understanding of people--environment relationships. : *The Geographical Journal*. Volume 168 Issue 3:: 193(2)

100. UNITED NATIONS, 2003**.** Assessment of drylands and desertified areas in the islamic republic of Iran**.** [New York]: United Nations Publications, 2003. - 78 p. ISBN: 9211200717.

101. UNITED NATIONS, 1992. Non-legally binding authoritative statement of principles for a global consensus on the management, conservation, and sustainable development of all types of forests ('Forest Principles'). In *Report of the United Nations Conference on Environment and Development*, Rio de Janeiro, 3–14,June 1992 (also available at www. un.org/documents/ga/conf151/aconf15126- 3annex3.htm and http:// habitat.igc.org/ agenda21/forest.htm).

102. UNITED NATIONS, 2004**.** Workshop to launch the thematic programme network on renewable sources of energy and environmentally sound technologies within the context of the regional action programme to combat desertification in Africa, TPN 5, Nairobi, Kenya, 5-6 May 2004 : general report .- Bonn: UN. Secretariat of the Convention to Combat Desertification (UNCCD), .- 21, 22 p. :graphs, tables

103. UNITED NATIONS, 2002**.** Global alarm: dust and sandstorms from the world's drylands . United Nations Publications, ISBN: 9211201144

104. UNEP, 1996. State of desertification in the Arab region and the ways and means to deal with it [State of desertification in the Arab region and the ways and means to deal with it]. (Arabic), Geneva (Switzerland); Arab Center for the Studies of Arid Zones and Dry Lands, Damascus (Syria).

105. UNEP/ FAO. 1999. Proceedings of the International Meeting on Special Needs and Requirements of Developing Countries with Low Forest Cover and Unique Types of Forests, Tehran, Islamic Republic of Iran, October 1999.

106. UNEP, 2002. Success stories in the struggle against desertification: a holistic and integrated approach to environmental conservation and sustainable livelihoods. Nairobi: UNEP, 2002. - xii, 163 p. : ill. ISBN 92-807-2278-6

107. United Nations Forum on Forests, 2003. Role of planted forests in sustainable forest management. Report of the United Nations Forum on Forests (UNFF) Inter session Experts Meeting, 25–27 March 2003, Wellington, New Zealand.

108. Villet, J.,/ FAO, Rome (Italy), 1985.The desert stops here: forestry for development in arid lands (Arabic, English) Information Div.; FAO, Rome (Italy). Forest Resources Div.; Forest Administration, Khartoum (Sudan).

109. Vogt, Kees, 1995. A Field Worker's Guide to the Identification, Propagation and Uses of Common Trees and Shrubs of Dryland Sudan. London: SOS Sahel International (UK).

110. Wickens G.E., Goodin J.R. and Field D.V (eds). 1984. Plants for arid lands. *Proceedings of the KEW International Conference on Economic Plants for Arid lands,* Royal Botanical Gardens, Kew, England, 23-27 July 1984. George Allen & UNWIN, London.

111. Wickens, G.E., Seif El Din, A.G., Sita, G., Nahal, I., 1995. Role of Acacia species in the rural economy of dry Africa and the Near East (English) In: *FAO Conservation Guide* (FAO), no. 27 / FAO, Rome (Italy). Forestry Dept., 138 p.

112. Woodhouse, Philip, Henry Bernstein Henry and Hulme David, 2001. African enclosures?: the social dynamics of wetlands in drylands . Trenton: Africa World Press, xviii, 238 p. : ill., maps ISBN: 0865439370, ISBN: 0852554168

113. Zohary, M., 1962. On hydro-ecological relations of the near east desert vegetation. Plant Water Relationships. Proc. Madrid Symposium, UNESCO, *Arid zone Research,* Vol.16, pp 1990-212

114. FAO publications

115. FAO, 2007. State of the World's Forests, 2007**.** FAO/Rome, Italy.

116. FAO, 2007. People, forests and trees in West and Central Asia, outlook for 2020. FAO Forestry Paper 152, FAO/Rome, Italy

117. FAO, 2006. Responsible management of planted forests: voluntary guidelines. *Planted Forests and Trees Working Paper* 37/E Rome.

118. FAO, 2006.The new generation of watershed management programmes and projects**.** FAO/Rome.

119. FAO. 2005. Alien and invasive species: impacts on forests and forestry. Rome (available at www.fao.org/forestry/site/27082/en).

120. FAO, 2005. Properties and management of drylands (land and water digital media) .- Rome: Food & Agriculture Org; DVD, 2005 ISBN: 9251052484

121. FAO, 2005. State of the World's forests 2005. Rome

122. FAO, 2004. Climate change and the forest sector- possible national and subnational legislation, FAO Forestry paper 144.

123. FAO, 2003**.** Data sets, indicators, and methods to assess land degradation in drylands: report of the LADA e-mail conference, 9 October - 4 November 2002. - Rome: Food and Agriculture Organization of the United Nations, 2003. - 109 p. ill. ISBN: 9251049254

124. FAO, 2003. Gender and sustainable development in drylands: an analysis of field experiences. - Rome: Food and Agriculture Organization of the United Nations (FAO), 2003. - 31 p.: ill.

125. FAO, 2002. The use of treated waste water (TWW) in forest plantations in the Near East region; Item 6 of the provisional agenda. Secretariat note (English) *Near East Forestry Commission*, Sess. 15, Khartoum (Sudan), 28-31 Jan 2002 / FAO, Rome (Italy). Forestry Dept.

126. FAO, 2003. Forest Outlook – Study for Africa. Regional report: opportunities and challenges towards 2020**,** FAO Forestry paper 141.

127. FAO, 2003. State of the World's forests 2003. Rome

128. FAO, 2001. Criteria and indicators for sustainable forest management. Compilers: Castaneda, F. Palmberg_Lerche, C. and Vuorinen, *Working paper* FM/5 FAO, Rome.

129. FAO/RNE, 2000. Practical guidelines for the assessment and measurement of criteria and indicators for sustainable forest management in the Near East. Cairo.

130. FAO/RNE, 2000. Regional Workshop on Forest Policy Formulation and Implementation in the Near East Countries**,** *Proceedings* (English)Cairo (Egypt),3-6 Jun 2000 / FAO, Cairo (Egypt). 2000, 108 p.

131. FAO, 2000. Report of the Open-ended International Meeting of Experts on Special Needs and Requirements of Developing Countries with Low Forest Cover and Unique Types of Forest, Teheran, Islamic Republic of Iran, 4-8 October 1999; Item 11 of the provisional agenda. Information note (Arabic, English) *Near East Forestry Commission*, Sess. 14, Teheran (Iran Islamic Republic), 1-4 July 2000 / FAO, Rome (Italy). Forestry Dept. 8 p.

132. FAO, 2000. Management of non-wood forest products for forest conservation and rural development in the Near East; Item 5 of the provisional agenda. Secretariat note (Arabic, English) *Near East Forestry Commission*, Sess. 14, Teheran (Iran Islamic Republic),1-4 July 2000 / FAO, Rome (Italy). Forestry Dept., 7p.

133. FAO, 2000, Management of natural forests of dry tropical zones, FAO *conservation guide* 32, Rome.

134. FAO/ FAO/RNE, 1999. International Expert Meeting on Medicinal, Culinary and Aromatic Plants in the Near East, *Proceedings* (English, Arabic), Cairo, Egypt,19-21 May 1997 / FAO, Rome (Italy). Forestry Dept.; FAO, Cairo (Egypt). Regional Office for the Near East, 98 p.

135. FAO, 1999. Urbain and peri-urbain forestry in the Near East: a case study of Iran and its capital, Tehran (English) Mehdipour Ataie, A., In: *Urbain and peri-urban forestry: case study in the developing countries* / FAO, Rome (Italy). Forest Resources Div., p. 163-191.

136. FAO, 1999. Urban and peri-urban forestry in the Near East: a case study of Cairo (English) El-Lakany, M.H., In: *Urban and peri-urban forestry: case studies in developing countries* / FAO, Rome (Italy). Forest Resources Div., p. 131-161

137. FAO/RNE, 1999. Report of the regional workshop on national forest programmes formulation and implementation in the Near East, Istanbul, Turkey, 11-12 Oct. 1999. Cairo.

138. FAO/RNE, 1999. Report on the FAO/UNEP meeting for national coordinators on criteria and indicators for sustainable forest management in the Near East countries, Damascus, Syria, 6-9 Dec. 1998. Cairo.

139. FAO, 1999, Agroforestry Parklands in Sub-Saharan Africa, FAO *conservation guide* 34, Rome.

140. FAO, 1998. Forestry and Food Security in the Mediterranean and Near East Region: Jordan, The Syrian Arab Republic, Turkey. Project findings and recommendations (English) FAO, Rome (Italy). Forestry Dept., 42 p.

141. FAO/UNEP, 1998. Accelerating the implementation of national level criteria and indicators for sustainable forest management in the Near East countries; FAO/UNEP National Coordinator's Meeting on Criteria and Indicators for Sustainable Forest Management for the Near East Countries, Damascus, Syria, 2-4 December 1998 (English) FAO, Rome (Italy). Forestry Dept.; UNEP, Nairobi (Kenya), 17 p.

142. FAO/RNE, 1997. Report of FAO workshop on criteria and indicators for sustainable forest management in the Near East, Cairo, Egypt, 30 June - 3 July 1997. Cairo.

143. FAO, 1997, Wildlife and food security in Africa, FAO conservation guide 33, Rome.

144. FAO. 1996. Forest codes of practice- contributing to environmentally sound forest operations. FAO Forestry papers No 133. Rome.

145. FAO/RNE/UNEP, 1996, Report (Arabic, English) FAO/UNEP Expert Meeting on Criteria and Indicators for Sustainable Forest Management in the Near East, Cairo (Egypt),15-17 Oct 1996 / FAO, Cairo (Egypt). Regional Office for the Near East; UNEP, Nairobi (Kenya) , 1996 , 31 p.

146. FAO, 1996. Development of Forest Resources for Environmental Protection and Food Security, Regional Near East. Project findings and recommendations (English) FAO, Rome (Italy). Forestry Dept., 20 p.

147. FAO/AUC, 1996. Silviculture and management of irrigated forest plantation in countries of North Africa and the Near and Middle East (English) American Univ., Cairo (Egypt). Desert Development Center; FAO, Rome (Italy). Forestry Dept., 36 p.

148. FAO, 1996. Dune Stabilization and Afforestation, Regional Near East. Project findings and recommendations (English) FAO, Rome (Italy). Forestry Dept., 50 p.

149. FAO, 1996, Income generation from non-wood forest products in upland conservation, FAO conservation guide 30, Rome.

150. FAO, 1995, Role of Acacia species in the rural economy of dry Africa and the Near East, FAO conservation guide 27, Rome.

151. FAO. 1995. Selecting tree species on the basis of community needs. Community Forestry Field Manual No. 5. Rome.

152. FAO, 1995. Climate change, forest and forests and forest management-an overview. FAO Forestry paper 126 (E)

153. FAO, 1993, Forestry and Food Security in Mediterranean and Near East Region, Jordan, 24-28 October 1993. Assignment report (English) Papadopoulos, I., / FAO, Rome (Italy). Forestry Dept. 46 p.

154. FAO, 1993. Agroforestry and multi-purpose trees in Near East and Mediterranean countries (English) Malagnoux, M., / FAO, Rome (Italy). Forestry Dept., 8 p.

155. FAO, 1993. Forestry policies in the Near East region: analysis and synthesis (Arabic, English) In: FAO Forestry Paper (FAO), no. 111 / FAO, Rome (Italy). Forestry Dept., 115 p.

156. FAO, 1993, Key aspects of strategy for the sustainable development of arid lands. FAO/Rome Italy.

157. FAO, 1989, Role of forestry in combating desertification. FAO conservation guide 21, Rome.

158. FAO, 1988, Non-timber uses of selected arid zone trees and shrubs in Africa, FAO conservation guide 19, Rome.

159. FAO, 1988, Arid zone forestry- A guide for field technicians, FAO conservation guide 20, Rome.

160. FAO, 1985, Sand dune stabilization, shelterbelts and afforestation in dry zones. FAO conservation guide 10, Rome.

161. FAO, 1982, Environmental impact on forestry, FAO conservation guide 3, Rome.

162. FAO, 1976. Development of marginal lands through forestry development range management, rainfed agriculture and socio-economic measures (Arabic, English, French) FAO Regional Conference for the Near East, 13, Tunis (Tunisia),4 Oct 1976 / FAO, Rome (Italy) , 8 p.

163. FAO, 1976, Conservation in arid and semi-arid zones, FAO conservation guide 3, Rome.

164. FAO, 1974. Tree planting practices in African Savannas. FAO, Rome (Italy). Forestry Development paper No 19.

165. FAO, 1974. The contribution of forestry and forest industries to integrated rural development (Arabic, English) FAO, Rome (Italy) , 1974 12.; FAO Regional Conference for the Near East, Amman (Jordan), 31 Aug 1974. 9 p.. Summaries (Ar, En, Fr); English ed. also issued in French and Arabic.

166. FAO, 1963. Tree planted practices for arid zones. FAO, Rome (Italy). Forestry Development paper No 16.

167. FAO, 1955. Tree planting practices for arid areas. FAO, Rome (Italy). Forestry Development paper No 6.