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**NATIONAL REPORT OF TURKEY
MOUNTAIN WATERSHED MANAGEMENT**

THE BRIEF OVERVIEW OF THE SITUATION OF TURKEY

Geography and Location

Turkey is geographically, politically and officially part of two continents - Europe and Asia. The smaller northwestern portion (Thrace) is part of Europe, while the larger portion (Anatolia) is part of Asia. Turkey is situated in the North hemisphere between latitudes 36 and 42, and East longitudes 26 and 45. Approximately, it has a total of 78 million hectare land area. About 8.333 km coastline extends along the Black Sea, the Sea of Marmara, the Aegean and the Mediterranean. According to 2007 Census, the total population is about 73.9 million.

It shares boundaries with Greece, Bulgaria, Georgia, Armenia, Azerbaijan, Iran, Iraq and Syria, with a total length of 2753 km. It holds a coastal length of 8333 km. This coastal zone includes the shores of Black Sea, the Sea of Marmara, Aegean Sea, Mediterranean Sea and the passages of Bosphorus and Dardanelles. Topography generally is very rough and steep.

Average altitude is 1,132 m and only 10 percent of the country is less than 250 m. above sea level. High mountains are concentrated in Northern, South and Eastern Anatolia. The mountainous terrain restricts agricultural development, only 24% of the land area is suitable, and nearly three-quarters of it is prone to erosion.

Climatic conditions and water resources

General climatic conditions of Turkey are formed by the Mediterranean big climatic region. Turkey's climate is under the atmospheric pressure of polar and tropical systems. The country lies somewhere between the temperate zone and the sub-tropical zone. Due to the climatic characteristic and some other specific hydrological, topographic and vegetative identities, Turkey is likely to be affected by desertification driven process such as irregular distribution of rainfall and high temperature and other events. Mountainous topography and sudden changes in altitudes create variety of local micro-climatic conditions over the country. These peculiarities are creating different seasons to be lived at the same time, over the different climatic regions of the country.

Two main types of climate are predominant in Turkey. (i) The Mediterranean climate with high temperature and dry summer and mild and wet winter, and, (ii) The Temperate climate with more rain and moisture in all seasons. However, Turkey is also one of the fortunate countries where all four seasons and various sub-climate types are present. Large plains, highlands, mountains and deep valleys mainly form its climatic variety. Turkey also divides into five basic sub-climate regions such as: Humid Mediterranean climate, Semi-humid Mediterranean climate, Semi-humid Marmara climate, Semi-humid Steppe climate and Continental Eastern Anatolia climate. Mean annual rainfall is about 646 mm which is unevenly distributed into seasons.

Biologic diversity

Turkey contains 75% of the plant species found in Europe. Some important species such as *cherries*, *apricots*, *almonds*, *figs*, and *tulips* all originated in Turkey. Flora includes many wild relatives of important commercial crops such as *wheat*, *chickpea*, *lentil*, *apple*, *pear*, and *pistachio*. Among continental countries, Turkey is one of the richest countries in terms of biodiversity where over 33% of its flora species are endemic. Studies indicate that there are 163 plant families covering 1,225 types, which in turn cover about 9,000 species. These grow naturally and about one third are endemic. Turkey has about 120,000 invertebrate, 410 fish (192 of which in inner waters), 414 bird, 8 turtle, 49 lizards, 36 snake, about 20 frog and 155 mammal species. The Biodiversity Strategy prepared in collaboration with the World Bank in 1997 classified four of the mammal species and 13 bird species as threatened by extinction.

Protected areas are quite few compared to the OECD average of 7.8%. Total area under different protection schemes such as national parks, nature protection areas, wetlands, wildlife protection areas, area-specific protected sites etc. covers approximately 3 million hectares of land. This represents the 4.3 percent of the total country's territory. However, initiatives for increasing such protected areas in the agenda of the country taking into consideration the demand of society as well the global debate.

In terms of hydrological considerations Turkey has divided into 25 hydrological watersheds. Mean annual water flow of these watersheds is about 186 billion cubic meters. According to the recent projections, per capita water consumption will be 1200 cubic meters in 2025. In this regard, water resources must be carefully protected, managed sustainably and efficiently used for the needs of next generation.

Total rain-fed based water quantity is about 501 billion cubic meters in Turkey. However, only less than half portion of this amount can be consumed in irrigation, hydro powers and drinking-cleaning purposes. In terms of technical and economical criteria, total usable quantity of water resources is about 110 billion cubic meters.

Per capita annual water consumption is about 1,642 cubic meters. This means Turkey is a quite poor country when it compares with the world averages. Despite these facts, Turkey is the richest country in the Mediterranean and the Middle East regions. The high average altitude which is about 1100 meters, and geographically mountainous conditions of the country make the distribution of water is generally irregular and costly. This does not mean that Turkey is a country where water shortage will never be a problem. In contrary, Turkey is seriously being affected by dryness conditions especially in the summers. The Euphrates basin alone covers more than 16 percent of total land area. While the total length of the watercourses exceeds 30000 km, there are 48 lakes, each having the surface area of more than 5 km², with the total area of 8900 km². The total area of dams is about 32500 km². Examination of Turkey's topographic structure on a physical map of the world shows clearly the country's high elevation in comparison to its neighbors, half of the land area being higher than 1000 meters and two thirds higher than 800 meters. Mountain ranges extend in an east-west direction parallel to the north and south coasts, and these are a principal factor in determining ecological conditions.

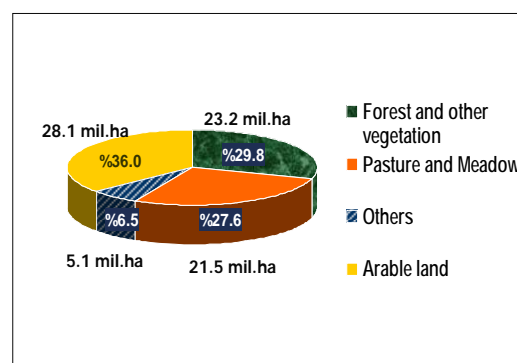
Wide variations in temperature and precipitation affect the country's flora and fauna, both in quantity and in range of species. Some parts of Turkey consist of arid highlands whereas others are thickly forested, and differences such as these play a crucial role in the distribution of wildlife around the country.

The basic land use patterns

Total territory of Turkey is about 78 million hectares including inland water surfaces. Some 28, 1 million hectares (36 %) is being used for agricultural purposes so called arable land. The vegetation covered land including forested land, scrubland and maquis is about 23 million hectares (30 %), the area of meadow and rangeland consists of 21,5 million hectares (27 %) and the other lands including lakes, rock, rivers, settlements etc. is about 5,1 million ha (6,5%).

Distribution of the major land use types in Turkey is illustrated as follows:

Land use Type	Total Area (000 Ha)	% of total land
Arable land	28.053	36.0
Pasture and Meadow	21.505	27.6
Forest and other vegetation cover	23.228	29.8
Water surface	1.158	1.5
Others	3.954	5.0
Total	77.898	99,9



The total arable land potential for irrigated agricultural practices is about 8, 5 million hectares. However, about 4, 7 million hectares of it has effective irrigation systems at present.

Turkey is also home to prominent mountains, superb beaches and diversity of landscapes. In the central part there are wide plains, all surrounded by (and mixed with) high, rugged mountains, including the Taurus, Koroglu and Pontic ranges. Many peaks exceed 3,000 meters, with the highest point being Mt. Ararat at 5,165m. The Tigris, Kizilirmak, Sakarya and Euphrates are major rivers, and Lake Van the largest lake.

Forest resources and forest management

Forests cover about 27 percent (21.1 million ha.) of Turkey's land area and have significant economic, environmental and cultural functions. Turkey's forest's are generally located in coastal and near coastal areas. A total of 21 million hectares of land are covered

with forests and this comprises some %27 of national territory, %51 of our forests is productive and the rest is unproductive.

Almost half of the country's total forests are unfortunately degraded, unproductive or naturally low quality. The distribution of the forested areas is also uneven in the country that some parts of the country are totally poor of forest resources. About 9.5 millions population is living in around 20 000 forest or forest-neighboring villages where forest resources make a vital contribution to livelihood of local communities. There are estimated 8.2 million people living in 17800 forest villages, dispersly situated in or near forest lands. In other word, forests and forest villagers are intermingled.

However, the life standards of these communities are quite lower than the country's average. Population of the forest villages is 11% of whole Turkish population. Migration from rural to urban areas continues.

According to current management plans, 83 percent of the forests is managed with wood production as the main objective and only 17 percent is assigned to other primary uses, mostly to protection of soil and water resources and also to biodiversity. Integrated and decentralized forest management planning processes is needed to ensure the participation of key stakeholders and greater attention to environmental values, biodiversity and local needs and preferences.

Urban dwellers are also taking an increasing interest in forests particularly with respect to their biodiversity, environmental and recreational functions.

In addition to the broad range of valuable commercial timber species, forests in Turkey host a great diversity of flora of economic importance, including various, medicinal, aromatic, industrial and ornamental plants. Among the plant products are oils and mastics (resin, styrax), trunk shells, flowers, thin brouches and spouts bulbs and rizoms, canes and roots. Today with the realization of the importance of plant products, the demand for non-wood forest products has increased.

Since the forests in Turkey spread out in the different ecological and topographical areas it is also rich in terms of non-wood products.

The permanency of forests, their sustainable management, the fight with diseases and pests, their protection from fires and the provision of similar forestry services all depend on the construction of proper infrastructures.

In recent years forest management plans are prepared in the light of multipurpose planning principles because of various ecological, economic and socio-cultural functions of forests. About 80 percent of total land area suffers from moderate to severe erosion. In Turkey, 5.9 percent of entire country (17.5 percent of forest areas) has been set aside for conserving natural values, especially biological diversity, and for preventing soil erosion and landslides.

The condition of land degradatation and soil erosion

The geographical location of Turkey and the country- specific environment, climatic, geographic, ecological and socio-economic conditions are the main factors that are very sensitive for erodibility and degradation of land resources in Turkey. It has long been recognized that the problems of erosion driven mismanagement of land and the lost of

vegetation cover are the basic causes of desertification and land degradation over the country. Therefore vast areas of country's territory are under the threat of water and wind erosion.

Erosion is one of the most acute environmental problems which are affecting 75% of the total land surface in varying levels of severity. About 73% of the cultivated land and 68% of the prime agricultural land (Classes I-IV) is prone to erosion. Stream bank erosion affects 57.1 million ha while wind erosion is severely affecting another 466,000 ha of land.

As a result, about one billion tons of soil is carried away each year. Proportion of areas prone to erosion is at a "critical" level in some provinces of the country where forested land is also relatively high. This indicates that agricultural land in these provinces mostly consists of difficult-to-hold soils of steep slopes where agricultural plots have been created through deforestation. The share of severe erosion is also relatively larger in areas where agriculture is practiced without any soil conservation measures. Erosion has other negative impacts, such as reducing the life of dams through siltation. Although abatement programs initiated several decades ago by the forestry, agriculture and water management related sectors that they have only been applied to 2.2 million hectares of area.

Varieties of methods and systems have been used on preventing and controlling of erosion. Besides these measures a great number of initiatives and techniques have performed on prediction of erosion control, prediction of drought and erosion, improvement productivity of land, watershed rehabilitation, conservation and sustainable management of land and water resources. A special attention is also given to expanding of vegetation cover and forested land particularly in sensitive and vulnerable areas. Followings are the main challenges on controlling erosion and preventing soil degradation practices:

- Afforestation on marginal (classes VI, VII and VIII) and bare land which are sensible for potential erosion and loss of soil,
- Rangeland improvement and expanding of grasslands and meadows in open lands preventing of soil loss done by water and wind,
- Reforestation in/or around the forested areas where the forests has long been degraded and had very poor forest quality,
- Encouragement of the active participation of local people and local administrative as well as the other stakeholders who are seriously affected by land degradation, land use planning and implementation,
- Encouragement of improved agricultural land use and cultivation practices such as contour plugging, irrigation methods, seed bed preparation, using of manure and fertilizer etc. to increase the soil productivity,
- Using of modern technologies on land use planning and monitoring such as GIS, satellite images etc.

As a result of the experiences and achievements have been done for more than 50 years it is importantly recognized that the measures for sustainable protection of existing forests are extremely important and so appropriate forest plantation (afforestation/reforestation) and other erosion related measures for preventing soil erosion are

strictly needed in Turkey in challenges to mitigate the negative effects of desertification and drought in Turkey.

In addition to human factors, natural factors like topography, geology and climate would increase erosion. Generally, Turkey has a high and mountainous land structure accelerating erosion along with its geologic structure.

Watershed Management in Turkey

The country has 25 main catchment areas with 9 major river basins covering about half of the entire land area.

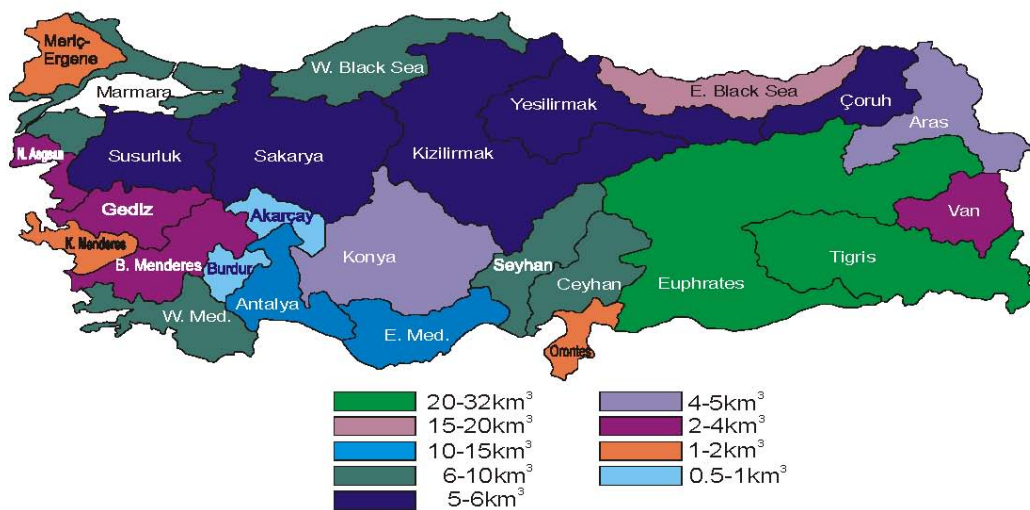


Figure 18. The river basins of Turkey (av. annual flow –km³) (SHW, 2003)

In the watersheds, there is both natural erosion and accelerated erosion as a consequence of human activities. Establishing forests through taking erosion precautions, in the water-collecting catchments of the stream and rivers, where precipitation-flow regime is destroyed, in the hillsides, where vegetation is destroyed; transforming degraded forest lands to fertile forest lands or improving vegetation; regulating water flow in the upper parts of the streams and establishing natural balance through this would prevent floods and overflows.

The root cause of this situation is a lack of integrated management, which affects the sustainability of forest management, as well as contributing to water pollution, the erosion of productive soils and instability of fragile ecosystems. The relationships among different elements of the environment, climate, soil, water, vegetation, wildlife and human activities, determine the ways in which a region can be developed sustainably to meet the needs of its population. The exploitation of natural resources (especially water, soil, and vegetation) is a threat to fragile ecosystems and needs to be carried out in harmony with resources conservation.

So far lots of projects throughout the region have been planned and implemented according to the integrated management approach. Some of these have been very successful

in terms of new technologies, coordination of public and private organizations and wider stakeholder participation.

In order to realize objectives, integrated watershed rehabilitation projects have been prepared by the Ministry of Environment and Forestry. Watershed rehabilitation is the work in order to take technical, cultural and administrative precautions to sustain natural balance between soil, water, and vegetation in the watershed, and to increase social, cultural and economic development of the community, living in the watershed.

General Problems of Watersheds in Turkey

- Erosion
- Degradation of natural resources
- Over- and irregular pasturage in rangelands
- Poor vegetation
- Degradation and over-use of forest lands
- Herd livestock
- Dispersed settlement
- Over-population
- Low level of efficiency in animal production
- Shallow and infertile soil
- Misuse of lands and agricultural techniques
- Insufficient farmlands
- Insufficient water resources
- Insufficient modern agricultural techniques
- Insufficient organic substance in farmlands
- Rural poverty
- Lack of training and awareness in the use of natural resources

Results of Land Degradation in Watersheds in Turkey

- Increase of Erosion
- Increase of Salinity in Soil
- Reduction of Agricultural Production (Quantity + Quality)
- Increase of Quantity of Insects and Illnesses (Vegetable + Agriculture)
- Reduction of Grass Efficiency in Rangelands
- Reduction of Biological Diversity
- Reduction of Water Capacity
- Increase of Forest Fire
- Plant Deceases
- Reduction of Water Resources
- Increase of the Necessity for Water
- Increase of the Degradation of Natural Resources
- Increase of the Floods
- Poverty and Migration

Institutions Interested in Watershed Management Services

The Ministry of Environment and Forestry of Turkey is the key responsible institution for the coordination of the implementation of the watershed management activities at national level. In the year of 2003, The Ministry of Forestry has been combined by the Ministry of Environment and then the General Directorate of State Hydrological Works was associated with the Ministry in 2007. The Ministry closely cooperates with other relevant institutions and stakeholders. The Ministry is also aware to give momentum on strengthening public involvement at all levels on the implementation, maintenance and promoting of related activities.

General Directorates of Ministry of Environment and Forestry that works in the watershed management : General Directorate of Afforestation and Erosion Control, General Directorate of Nature Conservation and National Park, General Directorate for Forest Village Relations, General Directorate of Forestry, General Directorate of State Hydraulic Works have been serving in watershed management in collaboration with the other related state institutions such as Ministry of Agriculture, Ministry of Public Works etc. and planning and research related bodies at national as well local levels.

Strategies and Priorities about Watershed Management Established within the Framework of Sustainable Development Plans and Policies

Five-Year Development Plans

All of the sector policies have been articulated in National Development Plans in Turkey. Forestry policies in these plans have traditionally been protection of forest areas, sustainable provision of industrial and fuel wood to meet the domestic demand, provision of non-wood products, afforestation, rehabilitation and reclamation of degraded forest areas, range improvement, erosion control, establishing green-belts establishing and expanding national parks and protected areas, protecting wild-life, providing social services such as recreation, hunting, eco-tourism etc. and also contributing to the rural economy to decrease their pressure on forests.

The plan highlights ecosystem approach for forestry under five principles which are 1) sustainability 2) multi-use 3) participation 4) protection of biodiversity and 5) contribution to the development and stabilization of community.

Five-Year Development Plans have been prepared since 1963 and last one, IX. Five-Year Development Plan was approved in 2006 for the period of 2007-2013.

In the consulting mechanism, partners from government organizations, non-governmental organizations, associations and groups of entrepreneurs, business institutions, and high level private institutions as well as professional and academic circles in compiling information, preparing the plans and monitoring of their implementation. The issues discussed with the partners included: the system, aims and priorities of the Plan, the structure of fund allocation for particular operational programs and priorities, the criteria for dividing actions into sectoral and regional ones, the integrated regional operational programme etc.

The 3rd Five Year Development Plan covers the period from 1973 to 1977 and emphasizes the provinces affected by erosion and environmental problems which are the regions unable to use their natural sources sufficiently and rationally. The determination of policies during that period, were based on agricultural pollution bound to fertilization and pesticide use. Thus inspective measures were taken in order to avoid the misuse of both fertilizers and pesticides.

Land planning, based on the rational management of soils, and was established in the 1977 by the action programme undertaken by the government. The new program consigned the 1 and 2 class arable lands i.e. the highly productive soil, only to agriculture.

In the 4th Five Year Development Plan (1979-1983), "the regions without a land management plan" were decided to be devoted to environmental protection. The 1983 action program pointed out to the importance of land management planning studies to be conducted together with ecological basin surveys in cooperation with local administrations.

Erosion, environmental pollution created by natural disasters, industrialization, and modernization in agriculture are defined as environmental problems in the 5th Five Year Development Plan. In that definition the environmental policies were determined and the environmental problems were identified at the planning stage of land use and investment, and all steps were taken in accordance with the concerned regulations.

The recent 9th Five Year Development Plan also comprises appropriate regulations (Articles 280,497,509) for the development and implementation of the sustainable management programmes sought to support the industrial and agricultural growth of the country, to cope with the ever-increasing rate of population and increasing loss of biodiversity. The other supplementary regulations to the said major legislations are being issued upon request and are in need of the relevant incorporating bodies and issues.

The Ministry of Environment and Forestry and its associated branches are primarily responsible for the forestry activities over the country. The Forest Law 6831 which has been in force since 1956 is the main framework of the forest policy and forest administration practices. Yet, some parts and articles of this Law have been renewed in accordance with the up to- date approaches and society's demands.

In addition to the Forestry Law 6831 which, has been in force since 1956, the National Park Law 2873 (1983), Forest Villages Development Law 2924 (1983), the National Afforestation and Erosion Control Mobilization Law 4122 (1995), Rangeland Law, Environment Law etc. are the other major laws that put forward the general outlines of the subject specific forestry and natural resource management aspects.

National Environmental Action Plan (NEAP)

A number of environmental conditions is closely linked the physical landscape of Turkey. In particular: country wide evenly dispersed rich biodiversity; sensitive ecological habitats; variety of cultural and historical resources; extensive shoreline and access to four seas that creates difficulties for managing coastal zones and marine resources; earthquakes

that are important natural hazards; mountainous and steeply sloped topography that causes soil erosion and require special agricultural techniques; region-specific heavy rainfall that enhances the risk of landslides and floods while aridity combined with human activity that leads to desertification; uncontrolled exploitation of mineral resources that causes landslides, contaminates groundwater; and threatens the safety of miners, significant hydrological resources that offers opportunities for water management but create environmental concerns and so on. These linkages and the conditions which need to be improved were all addressed in the NEAP.

The National Environmental Action Plan was prepared in May 1998, under the coordination of the State Planning Organization and with the technical assistance of the Ministry of Environment and the financial support of the World Bank. Until the Turkey's Seventh Five Year Development Plan (1996 - 2000) environmental issues have not been adequately incorporated into economic and social decisions. It recognizes this inadequacy and calls for development of a national environmental strategy. The Development Plan is the main instrument for coordinating government policies, including those for environmental management. The NEAP responds to the need for a strategy and can supplement the existing Development Plan with concrete actions for integrating environment and development.

Turkey's major environmental problems concerns such as the urban environment (air quality, water supply and wastewater, and solid waste management), natural resource management (water resources, soils and land, forests, biodiversity), marine and coastal resources, cultural and natural heritage, and natural as well as man-made environmental hazards etc. were particularly underlined in the NEAP too.

National Biodiversity Strategy and Action Plan

Turkey is one of the country Parties of the Convention on Biological Diversity, signed in 1992 and ratified in 1996 by the Turkish Parliament. Several institutions such as Ministries responsible for forestry, agriculture, environment, culture, foreign affairs and tourism are responsible for decision-making regarding the conservation of biological diversity and genetic resources. Each institution has the right and responsibility to declare conservation areas, make management plans for these areas or identify protection-usage principles. Appropriate legislative tools are also prepared by these institutions according to their responsibilities and duties defined by their respective legislation. The Ministry of Environment and Forestry has duty to coordinate all efforts for the conservation of biological diversity and sustainable use of biological resources.

The major threats on biodiversity are industrialization, agricultural modernization, and urbanization and infrastructure investments. Despite these and several other negative impacts, Turkey stands among one of the very few countries that retained its natural structure. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was ratified by Turkey in 1996 and came into force same year.

The National Biodiversity Strategy and Action Plan have been prepared by the coordination of the State Planning Organization (SPO) with the financial support of the World

Bank and technical support of the Ministry of Environment and Forestry. The Strategy and Action Plan contains three main topic areas: Steppe Ecosystems, Forestry Ecosystems, and Wetlands Ecosystems. Each ecosystem has its own specific protection and management practices. The goals of the Strategy are to conserve and use in a sustainable manner, to develop ecological management and resource management capacities, to enhance public awareness and train public and technical staff, make legal arrangements, develop international cooperation, and implement and maintain the strategies identified.

National Forestry Program

The preparation of the Turkish National Forest Program (nfp) was launched in 2001 and finalized in 2003. The program has been conducted under the coordination of the former Ministry of Forestry. The Ministry has welcomed and appreciated the involvement of all interested parties including a great number of representatives from forest villagers, non-governmental organizations (NGOs), academics, different field of forestry units, forestry professionals, other governmental agencies as well as private sectors. According to the program, the main policy for achievement the sustainable forest management reaffirmed as participatory, multi-purpose and ecosystem approach basis forest management is inevitable. The National Forest Program includes 30 policies, 56 strategies and 147 proposals for action. 40 of which were identified as long-term proposals and the remaining as short-term actions.

The National Forest Program has underlined the following main issues as priority concerns of Turkish forestry that are precisely related to the sustainable watershed management issues:

- Strengthening of poverty alleviation efforts for the forest-dependent populations,
- Combating to soil erosion, desertification and reclamation of degraded lands through integrated, participative watershed programs and projects,
- Decentralized planning and decision making in forestry by taking into account active participation of all stakeholders,
- Comprehensive planning for forest conservation, multi-disciplinary management of protected areas, national parks, biodiversity consideration, wildlife management,
- Improving the uncertainties of land tenure and ownership structures,

National Action Program (NAP) for combating to desertification and drought

Turkey gives a great importance for the implementation of UNCCD at all levels. All related institutions as well as UNCCD focal Point and National Coordination Unit are aware that the National Action Program (NAP) is the key operational tool for transforming the provisions of the Convention into concrete actions by means of appropriate measures to combat desertification. It is realized that the outline of NAP should address and identify the existing situation of Turkey regarding to erosion, drought and poverty, and then compile all relevant information through contributions and views of all stakeholders' participation.

The main objective of the NAP is to identify the main reasons of desertification and to determine the roles of central government, local administrative bodies, land owners, NGOs and public to find out the ways, mechanisms and tools on solving the problems identified and to combat the negative effects of desertification/drought in the country.

National Action Program has been prepared in parallel with the **Driver-Pressure-Impact-Response-DPSIR** approach which is created by European Environment Agency. Sustainable Land Management (SLM) was also considered as the main tool for achieving the targeted objectives.

NAP has identified proposed a number of immediate, mid-term and long-term actions including legislative, financial and institutional measures for reducing the impacts of desertification, rehabilitation of degraded lands as well as the improvement of land use practices where the sensibility of desertification/drought is high.

Turkey's long-term strategy on watershed management

Planning/implementation of all natural resource management and rural development integrated watershed basis, and planning/implementation of forest resources management as a major component of the integrated watershed management-rural development program.

Policy - A: Natural Resource Rehabilitation, Management and Utilization

- i) Sustainable conservation of existing forests and rehabilitation of degraded forest areas to provide multiple benefits, with particular attention to meeting needs of local populations;
- ii) Undertaking the required soil conservation measures on critical non-forest lands, which create serious damage or threaten lands, infrastructures and people of lower catchments;
- iii) Improving conditions, productivity and sustainable utilization of the rangelands;
- iv) Rehabilitation of streambeds and improving water resources utilization.

Policy - B: Livelihood Improvement

- i) Strengthening of livestock sector with regard to its comparative advantages. Increasing productivity mainly through securing winter feed and improved breeding;
- ii) Increasing income from crop production by productivity improvement and introduction of high-profitability crops. Promotion of maintenance of agricultural infrastructures;
- iii) Diversification of agricultural income sources, through promotion of products with high market values such as regional special products.

Policy - C: Human Resources Development

Strengthening the capacities of the stakeholders to understand the linkages relating sustainable natural resource management to human livelihoods, and implementation of effective village-level activities which simultaneously improve both.

SELECTED INTEGRATED WATERSHED MANAGEMENT PROJECTS:

The Southeastern Anatolia Project (GAP) is the country's most comprehensive, multisectoral integrated regional development project. It covers an area of 75000 km². When completed it will include 22 dams, 19 hydropower plants and about 1.7 million hectares of land will be irrigated.

Project Name	Subject of project
Ordu-Giresun Rural Development	Rural development
Çakıt Watershed Rehabilitation Project	Natural resources development Lively hood improvement Human resources development Erosion control
Çoruh River Participatory Watershed Rehabilitation	Natural resources development and protection Lively hood improvement Human resources development Erosion control Environment Marketing Range management
Anatolia Watershed Rehabilitation Project	Natural resources development and protection Lively hood improvement Human resources development Erosion control Environment
Eastern Anatolia Watershed Rehabilitation	Natural resources development Lively hood improvement Human resources development Erosion control

Main objectives of the watershed projects in Turkey: "to help to restore sustainable range, forest and farming activities in the upper watersheds of the three project provinces, reducing soil degradation, erosion and sedimentation in reservoirs as well as increasing productivity and incomes in this impoverished region of Turkey." These objectives were to be pursued through efforts to improve productivity of range and forestland, promote production

of fuel wood, fodder, and more sustainable use of marginal lands, facilitate the adoption of treatments for range and forestland to yield quick benefits, and to ensure increased involvement of local communities. A key underlying objective was environmental rehabilitation of degraded land. There was also a component for genetic resources conservation of indigenous species.

To improve forestry, range and agricultural activities in selected catchments in order to make these activities sustainable;

- By decreasing soil erosion
- By increasing soil productivity
- By increasing rural income

Indicators of sustainable management in mountainous watershed in Turkey.

- Positive change on traditional production systems and production without being harmful to environment,
- Improvement in collaboration between the government and villagers, more confidence in government,
- Better living conditions, better nutrition, and higher incomes.

LESSONS LEARNED:

In order to make the works more common and successful, integrated watershed rehabilitation projects should be implemented with a participatory understanding from all the institutions, working in the watershed, civil society organizations and people living in the area.

For the continued usage of our natural resources, it is necessary to constitute a database by using the present data. This situation necessitates the use of advanced technologies such as the geographical information systems and remote sensing in the storage and processing of the data and for putting them into service cheaply and at the necessary speed. In parallel with this understanding, the soil and water resources national information centre has been established in Turkey in the year 1999. The geographical data that are collected and produced shall be presented to the service of the users under different circumstances.

The use of watersheds as territorial units for planning and management can optimize human and economic resources, and achieve the sustainable development, conservation and preservation of natural resources.

The integrated watershed management concept that has evolved is centered on participation; but watershed stakeholders' participation is still limited, as are their links with decision makers.

Multidisciplinary participation and consensus can strengthen watershed management and training.

Information and databases based on the results of watershed management programmes and projects are essential tools for increasing cooperation and promoting future interventions.

In Turkey, there is increasing public awareness about the importance of managing watersheds with the help of integrated projects. Watershed management is one of the most important mechanisms for sustainably addressing the issues of global climate change and the negative impact of desertification.

The five main lessons are: (i) Pre-existing administrative or community processes, with risks of elite capture, often need to be challenged to accommodate the needs of women and the poorer households. (ii) Generally it takes more than the span of one project to develop and sustain new processes and skills to support community-driven development. (iii) Policies related to community forest management rights and responsibilities need careful analysis and possibly enabling legislative action in advance of a natural resources management project. (iv) In a project with substantial environmental objectives and often complex treatment trade-offs it is important to measure at least local environmental impacts. (v) In watershed treatments there are important issues of depth versus coverage, with potential trade-offs between high cost/high impact treatments on smaller land areas and low-cost low impact treatments on larger land areas.