REPUBLIC OF TURKEY
MINISTRY OF FORESTRY AND WATER AFFAIRS
General Directorate of Combating
Desertification and Erosion

NATIONAL STRATEGY AND ACTION PLAN TO COMBAT DESERTIFICATION

2015 - 2023

Forest and Water are Life.

GENERAL DIRECTORATE OF COMBATING DESERTIFICATION AND EROSION
ÇEM

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Kumluova - Muğla

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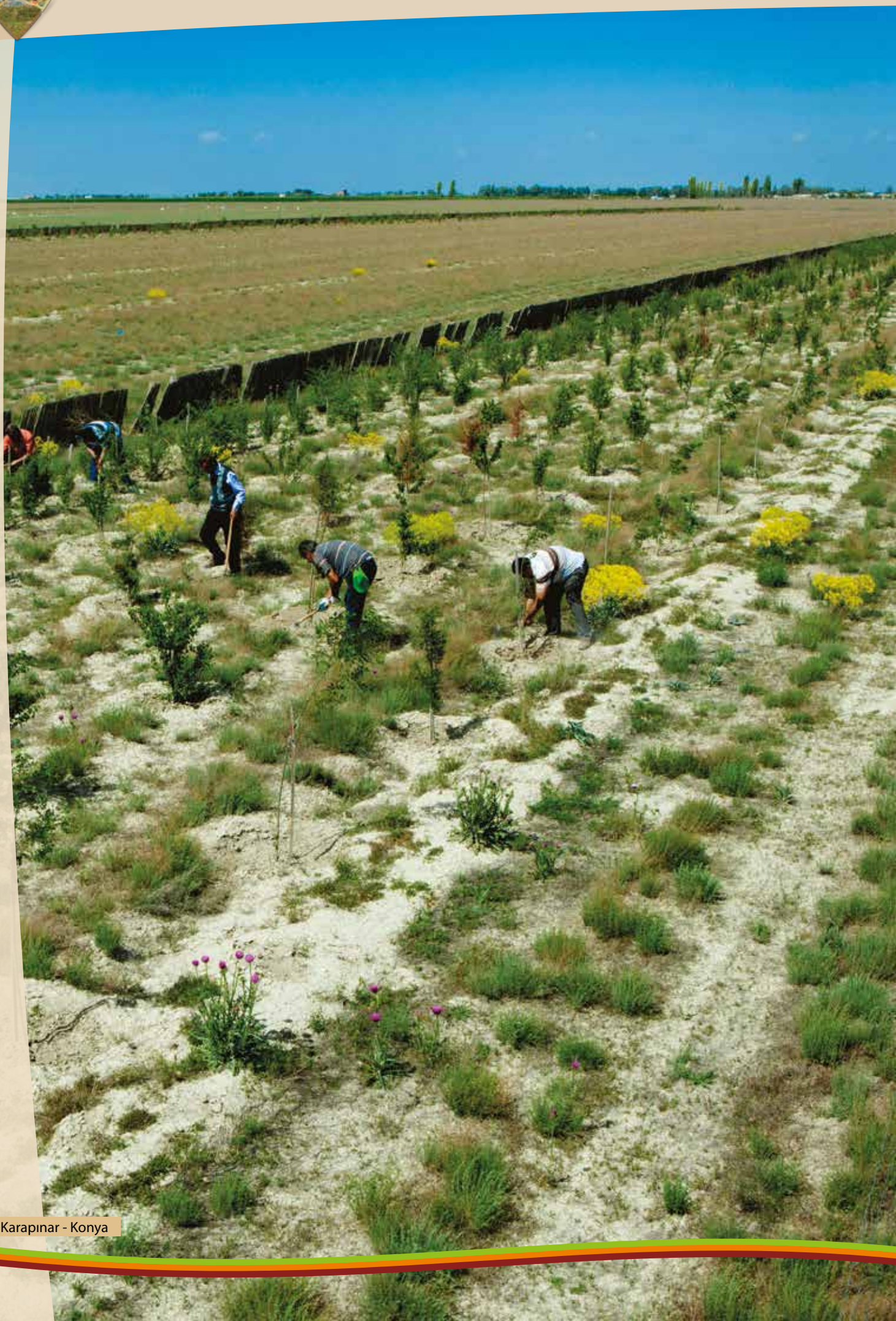


Karapınar - Konya

Preface

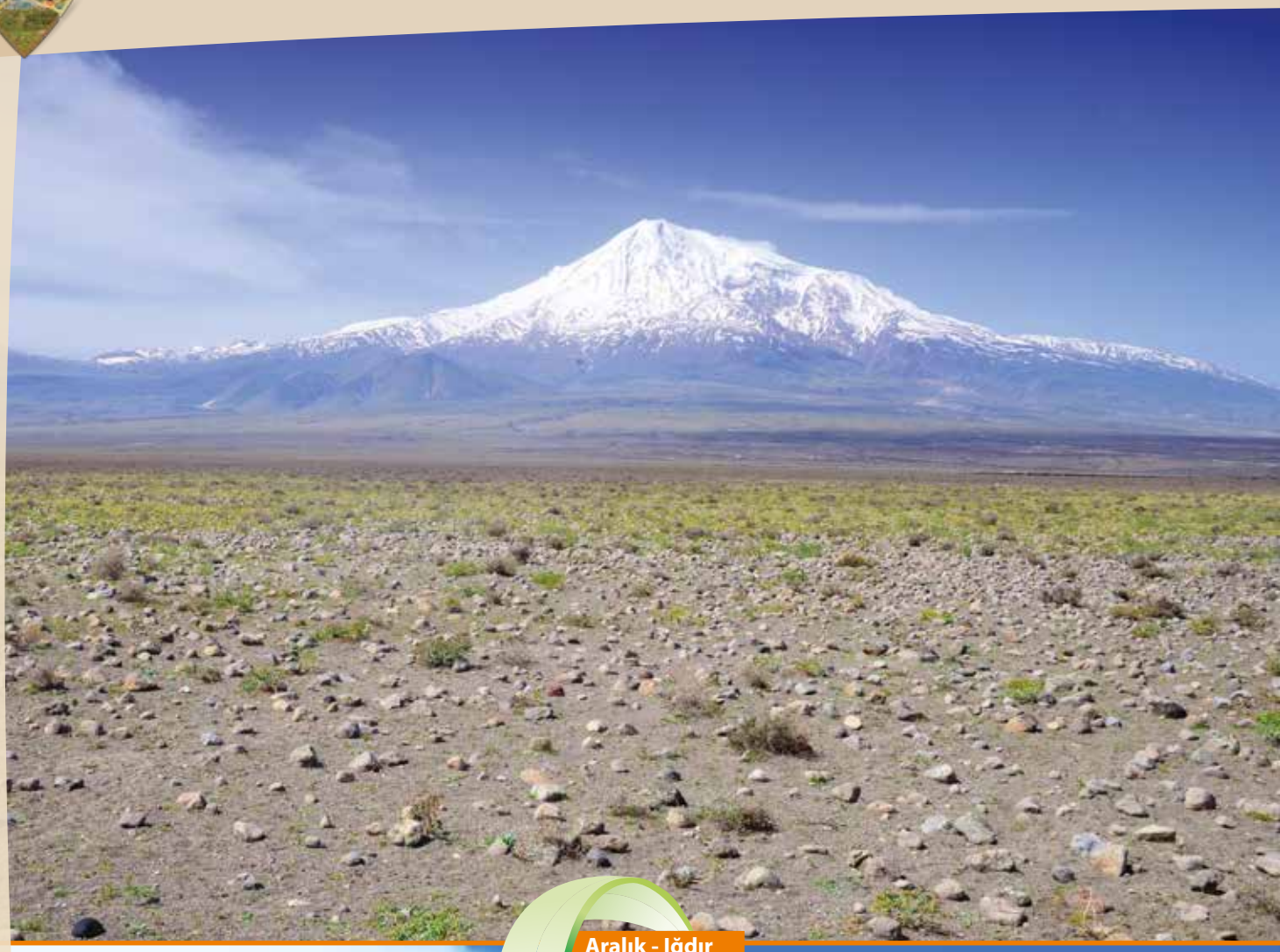
This document outlines the key Strategy and Action Plan activities for combating desertification and land degradation in Turkey, for the period 2015 to 2023. It forms the underlying basis in how Turkey will ensure the effective implementation of planned practices and coordination between different institutions. The proposed strategy covers a ten-year period; however, the action plan developed is for implementation within the first five years.

Turkey is a signatory to the United Nations Convention on Combating desertification (UNCCD), and this document outlines how Turkey will implement the key strategic aims of the convention. This paper has been prepared with necessary contributions from related parties as it impacts the coordination of Directorate General of Combating Desertification and Erosion in the Ministry of Forestry and Water Affairs. The Directorate General is the main focal point in the implementation of the UNCCD within Turkey and is responsible for ensuring coordination and cooperation between related bodies.

This Strategy and Action Plan is prepared in the framework of Turkey's approach to comply and apply the 10-year strategy document under implementation by the Secretariat of the UNCCD. In preparation of this document Turkey's obligations with respect to reporting needs during the preparation phase were taken into consideration. The Strategy and Action Plan covers the specific situation in Turkey and development of national targets. Further, its use encourages the spread of a positive attitude to overcome desertification in other countries affected by desertification and land degradation, especially within the region.

An introduction to desertification and land degradation and its causes in Turkey is reviewed. The necessary monitoring, evaluation and coordination practices to ensure successful implementation of the strategy and action plan is presented, including an introduction to institutional capacity and needs, and available financial mechanisms.

The document contains four sections and related Annexes. The Introduction summarizes the scope, and provides primary background information on the aim and basis of the Strategy and Action Plan. Section 2 starts with a world view on desertification and land degradation and focuses in detail on the current situation in Turkey, with related stakeholders, legislation and institutional structuring introduced. Implementation, results and experiences from the Turkish National Action Plan on Combating Desertification, enacted since 2005, are also briefly presented in section 2. The primary aims and objectives of the national action plan on combating desertification and indicators of success are described in the third section. The document concludes with a description of the necessary approach for the efficient implementation of the strategy and action plan. Monitoring and evaluation, institutional regulations, coordination and funding are further addressed in this section.



Aralık - Iğdır

YÜKSEK PLANLAMA KURULU

Tarih : 18/06/2015
Karar No : 2015/20
Konu : Çölleşme ile Mücadele Ulusal Stratejisi (2015-2023)

Yüksek Planlama Kurulunca;

Orman ve Su İşleri Bakanlığının 09/12/2014 tarihli ve 254140 sayılı yazısı dikkate alınarak; Orman ve Su İşleri Bakanlığınca, Kalkınma Bakanlığı, Gıda Tarım ve Hayvancılık Bakanlığı, Milli Eğitim Bakanlığı, Çevre ve Şehircilik Bakanlığı gibi ilgili Bakanlıklar, üniversiteler ve sivil toplum kuruluşları ile işbirliği yapılarak hazırlanan "Çölleşme ile Mücadele Ulusal Stratejisi (2015-2023)"nin kabulüne, karar verilmiştir.

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T.C. YÜKSEK PLANLAMA KURULU SEKRETERYASI

Altınova - Konya

Abbreviations

AFAD	Prime Ministry Disaster And Emergency Management Authority
AKP	Land Use Planning
BÜGEM	General Directorate Of Vegetative Products
COP	Conference of Parties
CICA	Conference on Interaction and Confidence Building Measures in Asia
CRIC	Committee for the Review of the Implementation of the Contract
CST	Committee of Science and Technology
ÇATAK	Environmentally Based Agricultural Land Protection Project
ÇEM	Directorate General of Combating Desertification and Erosion
ÇKS	National Registry of Farmers
DKMP	General Directorate for Nature Conservation and National Parks
DSİ	General Directorate of State Hydraulic Works
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FP7	Framework 7 European Union funding program
GEF	Global Environment Fund
GIS	Geographic Information System
GM	Global Mechanism
GDP	Gross Domestic Product
GTHB	Ministry of Food, Agriculture and Livestock
GUDER	Organic Product Producers and Industrialists Association
HİDS	Watershed Monitoring and Evaluation System
H2020	Horizon 2020 European Union funding program
IPA	Instrument for Pre-Accession Assistance
IPARD	Instrument for Pre-Accession Assistance Rural Development Program
ISBAP	Initiative to Establish Scientific and Technical Cooperation Networks and Platform Project
İDR	Internet Based Monitoring, Evaluation and Reporting System
İTU	Agricultural Good Practices
MERBİS	Pasture Information System Project
NGO	Non-Governmental Organization
OGC	Open Geospatial Consortium
ODOÜ	Non-wood forest products
OGM	General Directorate of Forestry
ORKÖY	General Directorate of Forestry - Rural Affairs
OSIB	Ministry of Forestry and Water Affairs
ÖİKR	Specialized Commission Reports
OSTIM	Renewable Energy and Environment Technologies Cluster
PDP	Priority Development Program
PRAIS	Evaluation of Performance Research and Implementation System
PYB	Project Management Unit
R&D	Research and Development
REC	Regional Environment Centre
RUSLE	Revised Universal Soil Loss Equation
SLM	Sustainable land management
SEC	FAO Sub-Regional Office for Central Asia
SFM	Sustainable forest management
STATIP	Detection and Treatment of Problematic Cultivated Lands Project
TAGEM	General Directorate of Agricultural Research
TARSIM	Agricultural Insurance Pool
TBMM	Grand National Assembly of Turkey
TÇG	Thematic working group
TEMA	Turkish Foundation for Combating Soil Erosion, for Reforestation and Protection of Natural Habitats
TİKA	Turkish Cooperation and Coordination Agency
TL	Turkish Lira
TRGM	General Directorate of Agricultural Reform
TUBITAK	The Scientific and Technological Research Council of Turkey
TUIK	Turkish Statistical Institute
UKB	National Coordination Unit
UKEP	National Capacity Building Action Plan
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention on Combating desertification
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Program
WMS	Web Mapping Service
WFS	Web Feature Service

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Definitions

The main definitions used in this Combating Desertification Strategy and Action Plan are presented. For certain definitions both UNCCD definitions and those developed by national experts are provided.

Land degradation: the UNCCD define land degradation as "Decrease or loss of biological and economic efficiency and variety in rain fed plantation, irrigated plantation, and in woodlands, grasslands and pastures, stemming from land use or, a process or a group of processes, including processes of human actions and types of habitats from (i) Land erosion influenced by wind and/or water, (ii) deformation of the physical, chemical, biological and economic aspects of the land; and (iii) long term deterioration of vegetation in arid, semi-arid and semi-humid locations". For the purposes of this document the definition of land degradation comes from the Turkish Desertification Expert Group, as "Loss of land in steppe, pastures, scrub/heath lands, woodlands or forestlands, as well as cultivated land, as to water and wind erosion; in general deformation of the physical, chemical, biological and economic aspects of the land, long term deterioration of vegetation; consequently, decrease or loss of ecological and economic efficiency of land."

Desertification: The UNCCD defines Desertification as "Land degradation in arid, semi-arid and semi-humid locations resulting from various factors including climate change and human actions." For the purposes of this document the definition of land degradation comes from the Turkish Desertification Expert Group as "The process of land degradation and decrease in ecological productivity especially in arid, semi-arid, almost arid to semi-humid, and almost humid and semi-humid land and any land in Mediterranean climate range regardless of aridity/humidity, as to climate change as well as physical, biological, political, social, economic and cultural aspects and their interaction."

Combating desertification (UNCCD definition): Conduct of activities towards (i) preventing and/or decreasing land degradation, (ii) rehabilitation of semi-degraded land; and (iii) rejuvenation of desertified land; as a part of integrated land development to ensure Sustainable development in arid, semi-arid and semi-humid locations.

Steppe Terrain: A realm including land, vegetation and other biological aspects that refers to the system with hydraulic processes.

Ecosystem services: Actions and processes that provide supplementary (e.g. food, water), regulatory (e.g. regulation of climate, air quality, drainage; water purification, maintaining land quality, prevention of diseases), supporting (e.g. food chain and water cycle, pollination) and cultural (e.g. recreation, aesthetics, educational assets) utilities and services.

Watershed: The point, within its natural borders, where the climate, geology, topography, flora and fauna are in interaction with water; where the water flows into the sea; in closed watersheds, it is the final location where water collects.

Arid, semi-arid and semi-humid land: Where the ratio of annual rainfall to potential evapotranspiration (P/PET) is between 0.05 and 0.65.

Aridity: A natural phenomenon where significant hydraulic imbalances occur due to low and/or irregular precipitation; and thus accordingly, natural land productivity is adversely affected.

Rehabilitation: Improvements using territory specific species and nature-friendly methods to resolve man-made damages as well as natural negative impacts on an existing ecosystems variety, functions and dynamic.

Tosya - Kastamonu

1. Introduction

1.1. Aim and Scope of Strategy and Action Plan to Combat Desertification

This Strategy and Action Plan summarizes the projected studies on combating desertification and land degradation in Turkey from 2015 to 2023. It forms the basis for efficient and cooperative implementation of the practices within the different institutions involved, in order to achieve the aims and objectives set. This Strategy and Action Plan is conducted through Turkey's participation in the legally binding United Nations Convention on Combating Desertification (UNCCD).

Desertification and land degradation is a global issue affecting a population of more than a billion people living worldwide. Desertification and land degradation leads to serious food safety issues in the countries affected. Through the United Nations, activity to combat desertification and land degradation has been undertaken. In 1992 at the Rio Summit, intergovernmental officials agreed on three conventions; in the context of this report to stop desertification, but also to limit activities that impact climate change and to reduce loss of biological diversity. The United Nations Convention on Desertification, Land Degradation and Drought was ratified in 1994 in Paris and was introduced in 1996. Turkey became a signatory to the convention in 1998.

In line with membership requirements, Turkey has undertaken to implement the requirements of the UNCCD convention. This is being done through the framework of the Turkish National Action Program to Combat Desertification, which commenced in 2005, and continues today. In line with changing conditions since then, the UNCCD Secretariat issued a "10-year strategy document" covering years 2008 - 2018, to facilitate member states in the implementation of national, regional and international strategies and action plans. The UNCCD 10-year strategy was approved at the Eighth Conference of Parties in 2007. Member states are expected to harmonize their national and regional strategies within the context of this document.

In 2013, the Ministry of Forestry and Water Affairs, Directorate General of Combating Desertification and Erosion (ÇEM) embarked on establishment of a national strategy to be harmonized with UNCCD 10-Year strategy document. The national "Strategy to Combat Desertification in Turkey" was finalized in 2013, following a number of high level meetings conducted in accordance with the official opinions of Government and related institutions (See Chapter 3 for Strategy). Following development of the strategy document, it was agreed to develop an Action Plan, implemented through a project to ensure a participative approach. The Action plan was developed within the scope of an agreement between ÇEM and Food and Agriculture Organization of the United Nations (FAO) Sub-Regional Office for Central Asia (SEC). The project was implemented in early 2014, with funding provided by the

Global Environment Fund (GEF). Besides producing the national action plan, the project also aimed to establish Turkey's reporting liabilities as a signatory to the UNCCD convention.

Certain basic principles were adopted during the preparation phase of the strategy and action plan; primarily to ensure a coordinated approach and full stakeholder participation. During the strategic planning process in 2013, and the action plan preparations in 2014, a series of meetings and workshops were organized, and several times opinions were received on early drafts (See Chapter 1 section 1.3.2). A number of representatives from various public bodies, academic institutions, NGOs and private sector organizations participated in the workshops (see Annex 1).

During the strategy and action plan preparations any existing documents, such as previous and current strategy documents, action plans, council resolutions, development plans, and so on, have been reviewed; and former plans produced by other organizations were also taken into consideration during the action plan strategy development and preparation phases. Designated priorities were to: 1) Combine the practices to be implemented by institutions and organizations in the scope of combating desertification and land degradation in the next phase; 2) gather them under a single authority portfolio; and 3) ensure active cooperation between institutions to drive successful implementation.

Last but not least, the UNCCD 10-Year Strategy Document approach, and reporting liabilities of Turkey under the convention were taken into consideration during the whole course of this study, and the Turkish Strategy and Action Plan format was designed accordingly. It should be noted that this document is not simply a copy of the UNCCD strategy document. This strategy and action plan defines and implements national targets for Turkey. Further, it aims to spread this approach over all countries under the influence of desertification and land degradation, and particularly those within the region.

It is equally important to ensure effective planning and efficient implementation of the Strategy and Action Plan to achieve meaningful results. This issue was evaluated fully during meetings with various institutions, organizations and experts during plan preparations; and includes recommendations on necessary monitoring and evaluation, financial structures, and coordination and cooperation needs, which are required for success. (See Chapter 4).

With all the accumulated experience gained during the preparation phase, it is reasonable to claim that this Strategy and Action Plan is produced in line with the most up to date information and experience in Turkey. In the coming years, there is likely to be an increase in knowledge and experience, as well as empowerment, due to technological advancements and developments in the academy. With this accumulated experience it will be possible to ensure more efficient preparation, participation and revision of the Strategy and Action Plan in the future.

1.2. Foundations

This Strategy and Action Plan on combating desertification and land degradation in Turkey, is underpinned by legislation. Respective primary legislation is as follows:

- The Constitution, Article 44, as follows:

  B. Land Ownership:
  The state shall take the necessary measures to maintain and develop efficient land cultivation, to prevent its loss through erosion, and to provide land to farmers with insufficient land of their own, or no land. For this purpose, the law may define the size of appropriate land units, according to different agricultural regions and types of farming. Providing of land to farmers with no or insufficient land shall not lead to a fall in production, or to the depletion of forests and other land and underground resources.

  Lands distributed for this purpose shall neither be divided nor be transferred to others, except through inheritance, and shall be cultivated only by the farmers to whom the lands have been distributed, and their heirs. The principles relating to the recovery by the state of the land thus distributed in the event of loss of these conditions shall be prescribed by law.

- United Nations Convention on Combating Desertification enacted in 1996, to which Turkey is a signatory through Law dated 11 February 1998 and numbered 4340.

- Public Funds Management and Control Law number 5018, Directive on Procedures and Principles for Strategic Planning in Public Bodies.

- Statutory Decree for Organisation and Responsibilities of Ministry of Food, Agriculture and Livestock numbered 639.

- Statutory Decree for Organisation and Responsibilities of Ministry of Forestry and Water Affairs number 645, which defines the establishment of Combating Desertification and Erosion Directorate General

- Legislation on desertification, erosion and land degradation, encompassing: Law of Soil Conservation and Land Use (number 5403); Law of Agriculture (5488); Law of Forest (6831); Law of Pastures (4342); Law of Environment (2872); and the Afforestation Directive and Good Practices Directive.

- National Development Plan, related specific Experts Commission reports (ÖİKR) (including 8th 5-Year Development Plan; Watershed Use and Management ÖİKR; 10th Development Use of Soil and Water Resources ÖİKR; Agriculture ÖİKR; Forestry ÖİKR; Environment ÖİKR; Climate Change ÖİKR; others).

- Other national strategy and action plans (Climate Change National Strategy and Action Plan; National Rural Development Strategy; National Biological Diversity Strategy and Action Plan; Mountainside Management Strategy; Agriculture Strategy Document; Combating Aridity Strategy and Action Plan; and others).

- Strategic plans of related public institutions and organizations (namely: Ministry of Forestry and Water Affairs Strategic Plan; General Directorate of Forestry Strategic Plan; General Directorate of State Hydraulic Works Strategic Plan; Ministry of Food, Agriculture and Livestock Strategic Plan; Afforestation Action Plan; and others).

- Prime Ministry Notice on "African Strategy" published in Official Gazette dated 26th March 2010, and numbered 2010/7 and the respective "African Strategy Coordination Committee" to which the Ministry of Forestry and Water Affairs is a member.

- Prime Ministry Notice on "Economic and Technical Cooperation Package Tailored for least Developed Countries" published in Official Gazette dated 5th January 2012, and numbered 2012/1.

1.3. Strategy and Action Plan Preparation Processes

1.3.1. Strategy Development

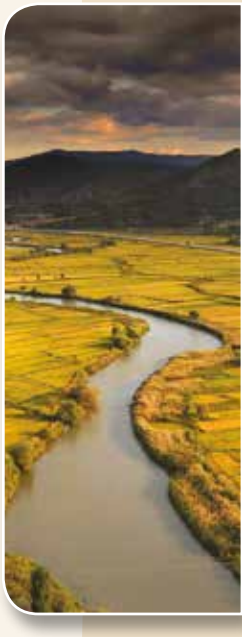
Turkey became a signatory to the United Nations Convention on Desertification, Land degradation and drought (UNCCD) in 1998, and is a legally binding requirement to combat desertification and land degradation. In 2005, this requirement was put in to practice through the National Action Plan, developed in line with our liabilities under the Convention. The National Action Program issued in 2005 is a document, which summarizes the necessary steps to be taken in preventing desertification, through efficient planning and practices of all institutions in Turkey.

In 2013 a further revision to the National Action Plan was needed in order to ensure harmony with “10-Year Strategy Document” prepared by UNCCD Secretariat. An evaluation of retrospective success was carried out and one outcome of this activity was the need for a broader and long-term strategy and associated action plan. The Directorate General for Combating Desertification and Erosion (ÇEM) began this development.

ÇEM finalized the National Strategy, to Combat Desertification in Turkey, in 2013. Several workshops were organized, which evaluated the reasons for desertification in Turkey; the challenges to implement the existing action program; strengths and weaknesses of the Convention were considered along with future opportunities and threats, all to ensure Turkey’s proposed activity was in line with global priorities. The final strategy results from a participatory approach and contributions from many institutions across Turkey.

1.3.2. Action Plan Preparations

After completion of the strategy document by the ÇEM Directorate General in 2013, the national action plan development process started. ÇEM developed a partnership with FAOSEC and prepared the alignment of Turkey's National Action Plan with the UNCCD 10-Years Strategy and Reporting Process project. The project was funded by the Global Environment Fund (GEF) and project activities were coordinated by the Project Management Unit (see Annex 2).



During the initial phase, lessons learned from implementation of the 2005 action plan were presented, and the principles to be adopted during the action plan process were identified. The Project Management Unit decided that the divisions within the plan should be based on landscape design; and the basic regional units would be agricultural land, pastures, forests, wetlands, coastal zone, steppe and settlements. This structure formed the basis for all related studies during Action Plan preparations.

Preparation of the Action Plan was initiated through a publicity meeting, which took place in Ankara in February 2014. Basic approaches to be adopted by the Action Plan were shared with meeting participants and opinions were requested, through a consultative and participatory approach, in line with UNCCD principles. Those individuals and institutions consulted developed a consensus on having specialized sub-groups to prepare background information. Four thematic working groups (TÇG) were established: namely Agricultural lands, Pastures and Steppe Thematic Working Group; Forestry Thematic Working Group; Wetlands, Coastal zone, Cities Thematic Working Group; and the Monitoring and Evaluation Thematic Working Group. A stakeholder analysis was conducted to identify persons that could contribute activity within each TÇG.

The next step in the action preparation process was undertaking and reviewing inventories of desertification and land degradation national strategies, action plans and other related planning documents. All documents were reviewed within thematic groups; actions related to desertification were collated and presented to stakeholders in TÇG meetings. The aim of such activity was to increase TÇGs' participants' awareness on current plans and fields of study, ensuring coordination, and avoiding possible duplication. Draft actions and performance indicators were prepared; schedules showing duration of each draft action and performance indicators, as well as coordinating organizations/institutions and stakeholders, were completed and submitted to participants before TÇG workshops. During the project period the four Thematic Working Groups had two workshops each (Table 1.1) and all, except the Monitoring and Evaluation TÇG, also had one additional sub-group meeting.

Table 1.1: Working Group (TÇG) meetings organized in the scope of action plan preparations. All held in 2014.

TÇG Meetings	Date
Forestry 1	19 March
Forestry 2	28 March
Forestry 3 (Sub group)	2 April
Agricultural land, Pasture and Steppe 1	27 March
Agricultural land, Pasture and Steppe 2	8 April
Agricultural land, Pasture and Steppe 3 (Sub group)	3 April
Wet lands, Coastal zone and Cities 1	2 April
Wet lands, Coastal zone and Cities 2	14 April
Wet lands, Coastal zone and Cities 3 (Sub group)	18 April
Monitoring and Evaluation 1	3 April
Monitoring and Evaluation 2	24 April

After the TÇG meetings, action tables submitted by the thematic working groups were merged into a single document, which was then evaluated by the Project Management Unit, and a revised Action Plan was produced. At that stage, actions identified by each thematic group were associated, so overlapping action and performance indicators were identified and merged at the same time. Subsequently, PMU visits were made to officials from related institutions/organizations and their additional remarks and suggestions were received and incorporated in to the document. Then, the resultant document was presented to all stakeholders involved in the process; their contributions were requested with an official letter; and the received statements were reflected in the Action Plan.

A draft of the actions and indicators were brought to the attention of participants for one last consideration at a Completion Workshop, held in Ankara, on 2nd June 2014, in order to ensure any final stakeholder suggestions and comments could be incorporated. A final draft version of the document was presented to the Combating Desertification Experts Commission who were given the opportunity to reflect on the submission and commission members' were able to comment, before the final plan was developed. Finally, during the action plan completion process UNCCD PRAIS report indictors were examined in detail; before final necessary revisions were made in the action plan to ensure conformability of indicators between the national action plan and PRAIS.

2. State of Play in Desertification/land degradation

2.1. Global Situation on Desertification/land degradation and International Cooperation

Desertification means degradation of soil and ecological factors in arid, semi-arid and sub-humid lands resulting from various reasons that include climate change and human activity. Although land degradation happens within various land structures globally; when it happens in arid lands especially, it usually generates similar conditions to deserts, which is why the term desertification is generally used.

The terms desertification and land degradation involve both degradation of soil and vegetation in productive areas such as agricultural lands, pastures; and degradation in natural environments such as wetlands, forests and steppe. Degradation in natural environments and production areas effects people directly; results of which include but are not limited to, reduction in food production and food security, poor economy and economic deprivation, particularly in rural environments and adjacent migration away from such lands, and conflict which my even lead to war. One of the main reasons for loss of biological diversity is deterioration of habitats due to desertification and land degradation. Similarly, carbon holding capacity is adversely effected by degradation which, in turn, accelerates climate change. Desertification and land degradation is one of the most significant global issues faced by people today.

According to United Nations Convention on Combating Desertification (UNCCD) data, approximately 70% of arid land worldwide is currently degraded. Each year, almost 24 billion tonnes of topsoil is lost due to desertification and land degradation. Topsoil is the most valuable part of soil in terms of organic nutrient content and on which agricultural activity is so heavily dependent. Apart from direct land loss, degradation of the physical and biochemical structure of soil means any remaining land may also be degraded. Degraded lands can become cracked and grooved, and water and wind acts to wash away important nutrients in the soil. Other factors affecting land include poor use of irrigation, where the soil may become oversaturated, which can lead to salinization; and lands may become squashed and hardened by herds of animals (both domestic and natural) and as such land loses its ability to retain sufficient vegetation.

1.2 billion people are thought to be directly affected by desertification and land degradation, 135 million of which are considered to be under serious risk. It is thought that almost 10 million people have had to leave their homelands and migrate due to desertification and land degradation. Globally, areas affected include Africa, the Middle East, Australia, South West China and South America. Within the Mediterranean region, including Turkey, tropical and sub-topical steppe ecosystems are particularly under serious risk.

One of the first observed, and most serious, desertification and land degradation influences in the world happened in Africa between 1968 and 1973 in an area known as the Sahel Zone. An area of approximately 5.4 million square kilometers it splits Africa in two and covers parts of northern Senegal, southern Mauritania, central Mali, northern Burkina Faso, extreme south of Algeria, Niger, extreme north of Nigeria, central Chad, central and southern Sudan, and northern Eritrea between the Sahara Desert to the north and the Sudanian Savanna to the south. It is estimated that almost 100 thousand people lost their lives, and 750 thousand people become in need of food assistance. This situation affected 50 million inhabitants in the region at different levels.

After this catastrophe, world leaders assembled in Stockholm in June 1972 to discuss, evaluate and to offer solutions to the problem as part of the first Environment Conference. Then at the UN General Assembly in 1974 agreement on international cooperation to combat desertification was discussed. In 1977, a UN Conference on Desertification assembled in Nairobi, Kenya, and the Combating Desertification Action Plan against desertification was discussed and accepted, including cooperation at national, regional and international levels.

The Intergovernmental Negotiating Committee was launched in 1992 to monitor and evaluate the action plan process and outcomes; and consensus on a Convention was developed; namely the "United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa". The Convention was accepted and put in to action on 17th June 1994. The convention aimed to support development and implementation of national and regional policies, programs and measures to prevent, control and mitigate desertification and land degradation. Today, there are 195 member countries to this convention. Turkey signed the Convention on 15th October 1994. The Convention was accepted under law in Turkey (number 4340) on 11th February 1998 and was enacted and issued through the Official Gazette on 16th May 1998.

UNCCD offers certain approaches and strategies to meet its objectives. One of the key approaches is implementation through national and regional action plans. National action plans aim to identify country-specific priorities in combating desertification and land degradation, and to ensure countries contribute to regional cooperation, raising of public awareness, do integrate combating approaches within national strategies and plans, improve national cooperation to ensure broad participation, and to delineate the necessary financial approach required for the planned activities. In 2005 Turkey put in action the Turkish National Action Program to Combat Desertification. The program shall be in force until this Strategy and Action Plan to Combat Desertification is enacted (For detailed information on Action Program, please see Chapter 2.4)

There are 5 Regional Implementation Annexes under the Convention and Turkey is part of the North Mediterranean Regional Implementation Annex, which includes Albania, Croatia, Cyprus, Greece, Hungary, Israel, Italy, Malta, Portugal, Slovenia and Spain. In accordance

with the Convention, member countries in the North Mediterranean Regional Implementation Annex shall provide active participation and contribution to activities in this region.

The regional agreement focus in Turkey is the Ministry of Forestry and Water Affairs. The Combating Desertification Department under Directorate General of Combating Desertification and Erosion (ÇEM), affiliated to the ministry, is responsible for the process.

UNCCD sets out certain approaches, principles and mechanisms to fulfill the primary goals. Main objectives of the agreement are to:

- Improve resilience of affected communities;
- Strengthen land management;
- Ensure diversified production patterns;
- Reclaim disturbed land;
- Minimize erosion;
- Disseminate non-wood energy resources;
- Generate alternative solutions such as biochar and no-till farming;
- Ensure an efficient global partnership.

Different approaches are recommended in the agreement to fulfill these objectives; among which are to:

- Develop and practice sustainable land management (SLM) technologies;
- Ensure capacity building and awareness at different levels;
- Build the necessary infrastructure to monitor desertification and land degradation and aridity as well as SLM practices;
- Accelerate evaluation and scientific studies;
- Prepare information management and decision support systems;
- Consolidate policies, legislation and institutional frameworks;
- Ensure finances and resources are mobilized;
- Adopt participation, cooperation and networking approaches.

One underlying theme within these approaches is the integration of gender and gender equality within all related processes, activity and outcomes; and is prioritized by all mechanisms in the agreement and the Conference of Parties. All member states are expected to adopt gender equality. Women constitute 70% of the culturally deprived people in the world; and have a 60% share in food production activity. Ensuring gender equality would lead to increased efficiency both in fighting poverty and increasing food production; which would pave the way to reducing the influence of desertification on local communities.

For the fulfillment of the objectives of the Convention, several mechanisms are identified and implemented to support and coordinate member states; one of which is Committee of Science and Technology (CST). The committee is responsible for providing recommendations and information to the Conference of Parties COP). CST has a well-disciplined structure and is

composed of qualified State officials. The Committee of Reviewing Implementation of the Contract (CRIC) provides reports and information about the state of project activities to the COP. Another mechanism operating under the Convention is known as the Global Mechanism (GM). GM is responsible with facilitating funding for contractual activities. As is the case with other mechanisms, GM also works under COP.

As is the case with many other Conventions, UNCCD has a secretariat, which coordinates the necessary communication, Organisation and publishing activities for the successful implementation of the project, especially COP. The secretariat is also responsible for providing the necessary support to member countries, if and when needed. The Secretariat carries out the necessary mechanisms for monitoring and evaluation of the contract; primarily the PRAIS (Performance Review and Assessment of Implementation System/Evaluation of Performance Research and Implementation System) system and reporting, which is developed for member countries as a means to upload information.

Turkey is a developed country in the scope of UNCCD, and is also a country affected by desertification. On one hand Turkey provides financial and technical support to other countries, and on the other, is an affected country and takes the necessary precautions for the successful implementation of the project at a national level, through its National Action Plan. Turkey reports in two different categories in the scope of the PRAIS system, as a developed country and as an affected country. ÇEM carries out the preparation of reports, supported by a variety of institutions who provide contributions. Previously, institutions at the national level have been providing their written comments, and ÇEM provided a synthesized report. Recent infrastructural changes mean that reporting is now done via an online database in a systematical way. Content of the database and reporting details are provided in Part 4.

2.2. The State of Desertification and land degradation in Turkey: Strengths, Weaknesses, Opportunities, Threats

With respect to geographical conditions and natural features, Turkey demonstrates Mediterranean and vicinity climate characteristics, which includes humid, semi-humid, semi-arid, arid, very arid and desert environments. Apart from the climate features, Anatolia is regarded as the cradle of civilization and is one of the earliest areas to domesticate plants and animals, thus the first agricultural activities took place here. Agriculture has long been practiced in Anatolia, and therefore, human impact on the environment is experienced to a greater extent and is why land and natural habitats in Turkey are highly sensitive to desertification and land degradation. In Turkey, desertification mainly occurs in production lands and natural ecosystems such as agricultural lands, pastures and forests, which are the focus of the analysis and planning approach employed in defining this strategy and action plan process.

In Turkey, erosion is one of the primary issues in desertification. According to information provided in the Fighting with Erosion Action Plan 46% of the total area in Turkey has a slope

more than 40%, and 62.5% has a slope of more than 15% (Figure 2.1). Different intensities of erosion affects 59% of the agricultural land, which is the biggest share of land use; affects 64% of pastures; and 54% of forest lands. The concept of erosion, and its adjacent threat, is publicly well known; but despite huge public participation in related studies, erosion still stands as a significant issue. For instance, erosion happens when incorrect cultivation practices are used in sloping agricultural land, yet such practices continue despite public awareness.

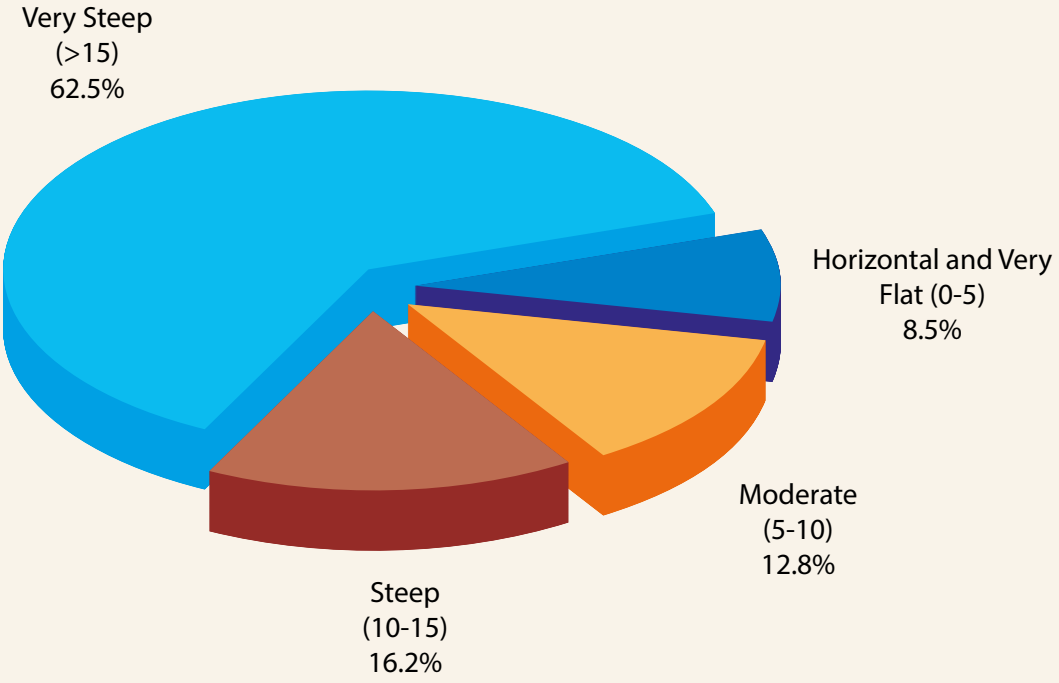


Figure 2.1: Percentage of slope in Turkish land

The impact of erosion in degradation of agricultural lands and pastures, destruction of forests and natural ecosystems and urbanization are the main causes of desertification and land degradation in Turkey. As a consequence, Turkey experiences revenue loss which in return has an adverse effect on farmers, where lost revenues change production habits in the short term, leading to the implementation of unsustainable methods. The need for input materials increases to compensate for the loss of efficiency due to land degradation, which may lead farmers to inextricable situations and as a result of this whole process, desertification and land degradation increases even more.

In Turkey, to a great extent, forest degradation has happened as a result of historic pressure and incorrect land use. Successful Afforestation and construction improvement studies means the forest land in Turkey has increased by 1.5 million ha since 1972. Wood wealth has also increased from 936 million m^3 to 1.5 billion m^3 between 1972 and 2012. Despite this half of the forest lands in Turkey remain degraded and need to be improved.

Steppes in Turkey are also impacted by degradation. A significant part of steppe has been transformed to agricultural lands for cultivation purposes, or destroyed as a result of overgrazing. Wetlands in Turkey, among all natural habitats, have the highest degree of destruction with almost half having been completely or partially destroyed during the second part of the last century.

Turkey is therefore sensitive to erosion, with respect to its climate, topography and soil structure. International agreements and studies to prevent severe damage from climate change requires soil conservation and watershed amelioration. The scope of erosion control activities include; planting forests, transforming degraded forest lands to fertile forest lands; amelioration of vegetation in water collection watersheds, degraded forest lands exposed to erosion, and sloping lands with destroyed vegetation; and planting to regulate water flow to redress natural water balance in river headwaters. Whereas combating water and wind erosion, dune identification activities, flood and avalanche control in mountainsides are done in the framework of soil conservation prevention activities. Activities in upper watershed aims to prevent or mitigate flood and erosion through reductions or prevention of surface flows. Moreover, green belt afforestation with various functions Aerial extent and Activities implemented in the scope of combating desertification are presented briefly in Table 2.1, Table 2.2 and Table 2.3.

Table 2.1: Aerial extent of activities to combat desertification (ha)

Activity type	2008	2009	2010	2011	2012
Afforestation	48 501	56 407	59 163	48 530	46 953
Rehabilitation	336 910	374 728	346 902	344 570	347 719
Erosion Control	53 917	50 352	61 401	67 088	83 131
Pasture Amelioration	76 642	77 521	79 968	82 114	81 635

Table 2.2: Activities contributing to combating desertification

Activity	Number (n)	Area (ha)
Provinces with completed Environmental Plan **(2005-2012)**	79	
Number of pools-ponds and water collection holes built for Forest Fire Fighting (2005-2012)	450	
Aerial extent of lands supported in organic farming (2011)		271 190
Aerial extent of land consolidation (2003-2012)		2 503 602
Increase in forest lands (2004-2012)		489 378
Preserved Areas (total, as of 2012)	2689	5 629 880

Table 2.3: Aerial extent of activities to combat desertification realized by the end of 2012

Job Description	OGM	DSİ	BÜGEM	OTHER	Activity Total
Erosion Control	1 015 010	55 425			1 070 435
Afforestation	2 070 333	24 681		85 750	2 180 764
Rehabilitation	2 492 683				2 492 683
Pasture Amelioration	151 834		446 534		598 368
Energy forest plant	622 878				622 878
Artificial regeneration	802 591				802 591
Special Afforestation	121 582				121 582
Directorate Total	**7 276 911**	**80 106**	**446 534**	**85 750**	**7 889 301**

OGM is General Directorate of Forestry, DSİ is General Directorate of State Hydraulic Works and BÜGEM is General Directorate Of Vegetative Products

Further detailed desertification and land degradation analysis for forest lands, agricultural lands, pastures and natural ecosystems in Turkey are provided in in the following sub-sections.

2.2.1. Analysis of Degradation in Forests

Turkish forests cover an area of 21.7 million hectares and constitute 27.6% of the country's surface area. Much of the Turkish forests, which consist of 60% coniferous and 39% broad leaved trees, are of natural and side-natural character, and demonstrate very rich biodiversity (ecosystem, species, genetic and process diversity) values. Total tree wealth of Turkish forests is approximately 1.5 billion m^3, and annual volume growth is around 42.2 million m^3.

In the past, a significant portion of Turkish forests were harmed and degraded due to human intervention and climate conditions. According to assessments made, based on closure level of forest cover, 53.3% of the current forests (11.6 million hectares) are classified as normally structured forests and 46.7% (10.1 million hectares) are degraded forests. Degraded forests, although covering almost half of forest areas, constitute only 5.2% of total tree wealth and annual volume growth.

Rapid population growth and industrialization puts a heavy pressure on natural resources and forests are severely affected from this negative condition. While a renewable resource, unlawful interference, unmethodical applications and exploitation without consideration of social and ecological utilities of forests are causing problems such as deforestation, pollution of air, soil and water supplies, desertification, climate change, and destruction of biodiversity. These negative impacts are trying to be overcome by new afforestation and rehabilitation works.

With almost half of Turkish forests being degraded it causes serious problems and insufficiency in wood production and provision of other functions. Rehabilitation and afforestation of degraded forest areas are among prioritized forestry activities. 20.2 million hectares of forest areas in 1972, were raised to 21.2 million by 2004 and were 21.7 million in 2012. In the last 40 years (1972-2012), forest areas were increased by 7.3%, total tree wealth (volume) increased by 60%, and annual volume growth rate increased by 50%, which points to a significantly improving trend in forest areas. The National Erosion Control and Forestation Mobilization Act enacted in 1995, and Forestation and Erosion Control Mobilization activity between 2008 and 2012 are key developments that made this improvement possible. Also, factors like forestation, forest zoning, recovering, rehabilitation and erosion control activities; relieving the pressure on forests by people migration to cities; keeping wood production from forests ration well under the current volume growth rate; raised public awareness about the importance of forests; and participation of local people and NGOs in protection and development of forests are all important components of this success story. Forestation of 2.2 million hectares, forest rehabilitation works on 2.4 million ha, soil conservation works on 1.1 million ha and in-forest pasture improvement works on 598 000 ha had been conducted until the end of 2012.

Main factors causing destruction and degradation in forests are determined to be as follows:

Illegal wood-cutting, land clearing, pasturage pressure

Countryside populations living in or around forests (currently around 7 million) have traditionally collected firewood and wood for other uses from forests. In previous periods, illegal wood-cutting was one of the primary factors in destruction of forests, but today its weight and importance have decreased significantly. Providing forest villagers' needs by legal means and at discount prices, migration of a significant portion of forest villages' population to big cities and towns, and usage of alternative energy sources (coal, bottled gas, solar power etc.) becoming widespread have contributed to these positive developments. Forest clearing with the purpose of opening agricultural areas has become less of a threat and when factored with migration. On the contrary, it is well known that very large abandoned marginal agricultural lands have become forested by youthening, which is one of the biggest factors in the increase in forest areas. Pressure and damage from animal pasturage in forest areas is still one of the main threats and destructive factors in many regions. Activity in sustainable management of in-forest pastures and the institutional capacity in this field is not yet at desired levels.

Allocation of forest areas for urbanisation, tourism, mining and other uses

Despite the pressure from forest clearing for agricultural purposes being much less than previously, the demand and pressure to gain land from forests for urban residences, tourism buildings and other facilities is growing rapidly. Thus forest areas are shrinking and allocation of forest areas for other uses is becoming one of the major where focus is needed.

In forest areas, permission requests for anything other than forestry activities are assessed within the scope of Articles 16, 17 and 18 of the Forest Act No 6831 through the Regulation on Practise of Forest Act Article 16, and the Regulation on Practise of Forest Act Articles 17 and 18. Special forestation permit requests within the scope of Forest Act Article 57 are assessed in accordance with the Forestation Regulation. As required by Article 8 of Tourism Encouragement Law no 2634, forest areas in cultural and tourism preservation and development zones are allocated to the Ministry of Tourism. According to 2011 data, the number of permits issued in accordance with Article 16, 17 and 18 of the Forest Act is 69 220, covering an area of 482 887 hectares.

Increasing expectations from society, and demands from NGOs about carefully conducting environmental impact assessments and monitoring prior to the allocation of forest areas for uses other than mining, hydroelectric power and forestry, have duly informing the public and ensured public participation in the process and is on a significant rising trend.

Forest fires

12.5 million hectares of Turkey's forests, which constitute 60% of the total, are located in zones such as Mediterranean Region, which are sensitive to forest fires. First and second order forest fire sensitive zones cover 7.8 million and 4.6 million hectares respectively. Thus, firefighting is a primary concern in the management of forests and forest preservation issues. A large budget is set aside in order to take necessary precautions and activity to prevent and extinguish fires. Media campaigns to raise awareness and improvements in fire watching and developments in communication systems have all contributed significantly to preventing and decreasing fire damage and destruction. In the decade between 2002 and 2013, 25 944 forest fires occurred which damaged 105 548 hectares or 4.07 hectares per fire, used as a measure fire-fighting success rate. This shows Turkey to be one of the best countries in fighting forest fires around the Mediterranean.

Insect and disease threats

Insects and disease pose a significant threat and can do serious harm to forests. Insects have a very high breeding energy and may threaten a whole forest if developing in huge numbers under the right climate conditions. Insect and disease damage can be more harmful than forest fires, especially for species such as spruce, abies, pine, chestnut and elm. It is well known that afforestation using fast growing non-native trees or natural species are especially vulnerable to such damage. Fighting insects and diseases using chemical agents, as has been done in the past, has been abandoned due to the wide-scale harm it had been causing.

Currently precautions to support the natural structure and resistance and durability of forests, and biological methods (such as introductions of insect and bird species which feed on harmful pests) to combat disease and pest infestations have been adopted for the moment. Approximately 600 000 insects have been produced in 65 laboratories established for this purpose, and have been released into environments containing harmful pests to support re-establishment of the natural balance. In addition approximately 50 000 bird nests have been

deployed to encourage settlement, along with 150 ant nests. Approximately 50 types of harmful insects/pests are targeted in approximately 500 000 ha of Turkish forests. Tree removal is used to combat disease also and a volume of 300-400 000 m^3 extraordinary cutting has been performed. From 2002 to 2012, actions to combat pests and disease have been performed in approximately 6.1 million hectares of land. In 2013, an additional 340 041 ha of land has been subject to such activity and a budget of 4 599 002 TL has been spent.

Forestry approaches and applications damaging biodiversity

Management of forests in Turkey has been aimed at wood production and provision of other similar benefits, including applications to develop specific forest structures to maximize quality and quantity. Some approaches and pressure to use forests as income sources and managing them purely to satisfy human needs are considered to be among more negative developments and is an approach that has caused negative impacts on the natural structure and biodiversity of forests. Recently the General Directorate of Forestry (OGM) has placed a high importance on multi-functional forest management planning and efforts to intensify sustainable forest management criteria and indicators are very important in terms of protecting biodiversity. Among these, efforts to integrate biodiversity into forest management plans, developed by OGM, are a very important development. The General Directorate for Nature Conservation and National Parks (DKMP), NGOs and scientific institutions' efforts to increase preservation areas, to monitor biodiversity more closely and a raising of awareness in society contribute a great deal to this multi-functional forest management planning process.

Effects of air pollution, aridity and climate change on forests

Effects of climate change on forests, which has been globally established over the last 25 year are also a serious problem for Turkey's forests. Projects and studies monitoring and assessing how air pollution affects forests are being coordinated by OGM in cooperation with international institutions. Carbon sequestration in Turkey's forests is estimated to be approximately 1.1 billion tonnes. 717 million tonnes of this is in forest biomass and 416 million tonnes is the carbon kept in forest soil. Annual additional carbon due to growth in forests is estimated to be approximately 30.5 million tonnes. These values show the significant contribution and potential of Turkey's forests in fighting climate change. OGM has been conducting collaborative activity with various institutions in recent years, to ensure forests can accommodate effects of climate change, including determination of approaches and actions for forests' being integrated into regional forest management plans. These studies are planned to continue and increase in the coming years.

Overall, there are a number of issues that Turkey's forests have to overcome to ensure sustainable management of forests, identified through an examination of the strengths, weaknesses, opportunities and threats (SWOT) (Table 2.4).

Table 2.4: SWOT analysis of studies and activity carried out to combat forest degradation

Strengths: • Forest organization, with country wide offices and units, excellent experience and information; • Legal infrastructure; • A strong circulating capital and income system; • Placing importance on preservation and reclamation of forests, and accumulated knowledge and experience on these issues; • Functional planning, products and services other than wood, and increase in interest and studies in these fields; • Technological infrastructure; • Policies, institutional and legal regulations to further develop the relations with forest population.	**Weaknesses:** • Frequent changes in legislations and institutional structures; • Overlapping authority and authorization conflicts between separate units and institutions; • Over-employment in central structure, wide areas of responsibility and lack of staff in field application units; • Insufficient dialogue and cooperation with groups of interest; • Problems in lack of coordination and participation; • Unfinished forest land survey studies and unresolved property issues; • Half the forest land being infertile; • Lack of institutional capacity and need for development in providing products and services other than wood.
Opportunities: • Raising awareness and improving interest about the importance of forests and its ecosystem services; • Empowered NGOs and public movements; • Technological advancement and strong educational and scientific research institutions; • Advancement in information technologies; • Less pressure on forest areas due to migration from forest villages; • Our commitments during EU harmonization process and international agreements and processes concerning forestry which Turkey is a party of; • Positive developments in interest and budgeting from the government towards forestry activity.	**Threats:** • Increased pressure to exploit forest areas with urban residence, tourism, mining and similar purposes; • Increased pressure to improve wood production from forests to cover the increased needs of increasing population and growing forest industry demands; • 7 million people with low income and limited means, living in villages or around forests; • Negative effects of climate change and aridity; • Conflict of interest between ministry aims and other sectors' interests.

2.2.2. Analysis of degradation in agricultural lands

Total agricultural land in Turkey (cultivated agriculture and pastures) is approximately 38 million and 428 000 hectares respectively (TÜİK, 2013). Irrigated farming is performed within 17% of plantation areas, and dry farming in the remaining 83%, with 17% of the total area lying fallow.

Following population increase in previous periods in Turkey, agrarian zones have also increased significantly. Increase in agricultural land use, mainly due to mechanisation, stopped in early 1990s, and the aerial quantity of agricultural lands started to shrink after that. The main reasons for this were allocation of agricultural land to other uses, some of the land used by small scale groups being discharged from the sector and their lands becoming non-agricultural, land degradation due to incorrect agricultural applications, migration from the countryside to urban areas and property problems. In recent years, arable land use has not kept pace with population increases, leading to increased pressure on available soil use and thus degradation in agricultural land has become a more common problem.

In examining the way current land stock is used, it is noted that 5 million hectares of land suitable for cultivation is used inefficiently and uneconomically, and a further 5 million hectares of land is being used for agriculture despite it not being suitable, and as a result losing overall fertility due to erosion damage. Also, stony areas are one of the biggest problems faced by the country's agriculture, with almost 3 million hectares of agricultural land suffering from this issue. In Turkey, agricultural land is poor in nitrogen, despite it being one of the richest nutrients in both organic matter and macronutrients. Turkey's land assets, which are available for all kinds of vegetative production, are limited to 11 million hectares in total.

Various projects and activity are organised in Turkey to increase the efficiency with which agricultural lands are managed. Among these are land fragmentation per farmer, irrigation, land consolidation, farmland development works, land use planning and legislation introduced to establish a land information system and database. Issues in food production, safety and reliability, countryside development, preservation of soil, water and biodiversity and ensuring efficient use are prioritized in the Ministry of Food, Agriculture and Livestock (GTHB) 2013-2017 Strategic Plan.

Factors causing degradation in agricultural lands are assessed briefly, as follows:

Soil surveys unfinished

Agricultural land classification in Turkey was completed using information gathered from geographical information systems within the scope of the Detection and Treatment of Problematic Cultivated Lands Project (STATIP) in 2006. An update, to include any new land usage larger than 1 hectare, is expected to be completed soon. The General Directorate of Agricultural Reform (TRGM) has retained the data in a database since 2007, and has been putting emphasis on soil surveys to establish a national soil database. TRGM has so far made soil classification for 2 million hectares of land, and aims to consolidate a further 1 million hectares annually. Various institutions have consolidated approximately 2 952 000 ha of land by 2013.

Management is partitioned and small scale, management size issues

One of the factors that defines poor efficiency in Turkey's agricultural land management is that it is conducted through a small scale and partitioned structure, lacking overall coordination. According to the 2001 General Agricultural Inventory (GTS) results, 65.5% of agricultural management is conducted on land covering less than 5 hectares, and only 7% larger than 50 hectares of land. Small scale management and a partitioned land structure has a negative effect on efficiency, precautionary actions are getting harder to take and production costs are increasing. The Soil Protection and Land Use Act no 5403 did not prevent fragmentizing of agricultural lands, and lands have been getting more separated into smaller units, either through sale or inheritance. GTHB has made some efforts to change the Land Law and as of 2014 positive changes have been implemented to prevent agricultural land partition.

Incorrect land use: Changing purpose

Between 1989 and 2010, various sections of Turkey's population have demanded that 2.4 million hectares of land be re-classified out of agricultural use, with 827 000 ha of land permitted for use other than agriculture. In Turkey, reclassified agricultural land is most commonly used for industry, urbanization, housing, and tourism, mining and public investment for transportation. Reduction in agricultural growth is partially caused by urban growth in Turkey, and primary factors affecting this can be summarized as:

1) The Construction Zoning Law, which sets the base for city plans and legislation for local authorities, does not contain sufficient tools and means to preserve cultivated lands and ensure sustainable use of these;
2) There are practical problems implementing the Soil Protection and Land Use Act no 5403;
3) Towns of all sizes have improperly built houses in contravention of zoning plans, which cause harms on agricultural lands surrounding cities;
4) The concept of city ecology is missing from Turkey's planning and implementation practise; and
5) Authorities are unable to develop whole and consistent policies because of narrow sector based viewpoints.

Agricultural land use plans incomplete

In Turkey, preparing Land Usage Plans (AKP), utilising current soil maps to administrate all agricultural lands, is very important. The following studies should be made to fully identify and solve all issues regarding AKP, namely:

1) Preparation of detailed maps to set a base for AKP;
2) Providing input in the form of information and data for other planning activities;
3) Preparing a national agriculture inventory to EU standards and based on geographical information standards, and establishing an infrastructure for sharing this data;

4) Defining land usage planning models at different levels;
5) Strengthening inter-institutional relations and collaborations; and
6) Intensification of activities that raise awareness at every level of society on the rational use of agricultural lands, one of Turkey's most important natural resources.

It is identified in GTHB (2013-2017) Strategic Plan that land usage plans will be set to ensure economical use, preservation, reclamation of agricultural fields; determination of large plains and erosion sensitive areas; determination of alternative fields for non-agricultural use; and prevention of misuse of agricultural fields, ensuring required conversions are done using current land usage methods. A "Method Research Workshop" was held in 2011 in order to develop Land Usage Plans (AKP). This workshop aims where to prepare AKP in order to plan agricultural production at country, regional, and local levels, executed through production pattern setting. In addition, a further aim for this plan is to provide binding data for urban housing, industry and other land usage plans prepared by other relevant institutions and organizations.

Erosion problems

One of the major issues for Turkey is erosion. 59% of cultivated agricultural lands and 64% of pastures are facing an erosion problem. Erosion in agricultural land is on the rise due to destruction of land cover that keeps the soil with their roots and stems (forest, heath land, pastures, etc.), not practising preservative agricultural techniques in sloping agricultural lands, ploughing vertically along the slope, and cultivating on steppe and shallow lands not suitable for agriculture (class VI and VII). GTHB included preventive precautions against erosion in agricultural land through their strategy and development plan. One of the main strategic aims of the Countryside Development Plan (2010-2013) is transition to "product patterns suitable with soil structure and water sufficiency" under "Preventing Erosion in Agricultural Land" activities. A number of projects have been or are being undertaken, as follows:

1) Under the Preparation for Environment and Rural Landscape Activities Implementation measures of IPARD Program (2007-2013), there is an "Erosion Control" sub-measure. Regional moisture increase in soil, suitable fertilizer imposition, biological and integrated combat, strip tillage or parallel to levelling curve agriculture, zero tillage, minimum tillage agriculture and moisture gathering practices are implemented in Research Institutes under the GTHB TAGEM programme, along with erosion estimations, measurements and mapping, and erosion prevention and control practices.
2) GTHB and OSIB are conducting collaboration projects for erosion prevention. GTHB and OSIB are also collaborating in Erosion Monitoring Systems activity.
3) The Runoff Rate and Soil Loss Determination Project is conducted through a ÇEM, OGM and TAGEM collaboration.

4) The Igdir Aralik Region in Turkey is under wind erosion threat and the Wind Erosion Monitoring System project aims to assess wind erosion risk by direct measurements and Renewed Wind Erosion Equation (YREE) approach in this region.

5) Using Wind Erosion Risk Assessment, it is aimed to determine wind erosion risk by direct measurements of different land usage, in Altinova and Gozlu agriculture management areas in Konya closed watershed.

Closed drainage and land reclamation

73% of water consumption in Turkey is used by the agriculture sector. Generally, traditional methods of irrigation are used including 81% of all management areas opened by DSI using surface irrigation, 14% use sprinkler irrigation, and 5% use drip irrigation. Incentive support to ensure efficient use of water resources is provided, such as specific irrigation organizations in order to establish pressure irrigation, grants to farmers and credits with interest reductions. Having drainage systems in surface irrigation areas is very important in Turkey in terms of preservation of soil and water resources. Especially so in water networks where there is no established irrigation culture or natural drainage, where excessive water use causes salination and threatens agriculture lands. Approximately 3 million hectares of land in Turkey has a drainage problem. In 1.5 million hectares of land, which constitutes 31% of irrigated areas, there is a salination and sodification problem. Annual rate of rainfall in Turkey is insufficient in terms of washing out the salts in soil, both in total amount and regional distribution, therefore salination increases and this hastens desertification. As a result biodiversity decreases and the ecosystem is affected negatively. After the Harran Plains in South East Anatolia were opened to irrigation, excessive water usage by farmers aggravated this problem to significant magnitude. TRGM started drainage and field development works to revitalize problematic areas in this area.

Loss of biodiversity

The small, partitioned and scattered agriculture field structure creates an advantageous situation for wild plants, animals and biodiversity generally by creating small living spaces for all. On the other hand, most of the agricultural land is in steppe ecosystems, and that makes it harder to distinguish between agricultural biodiversity and steppe biodiversity. The biggest decrease and loss in terms of ecosystems in Turkey is observed in steppe ecosystems. The primary reason for this is that steppe areas are found in plains, they are close to settlements, and these ecosystems are relatively unattended. Despite its rich agricultural genetic resources and medical and aromatic plant genetic resources, which has a very important economic potential, Turkey can use very little of its potential, through reclamation, cultivation and production, due to a lack of finances and preservation programs. TRGM is conducting various studies to establish ecological corridors to preserve agricultural biodiversity and ecosystem services, applied parallel to consolidation works. Another factor adding to biodiversity loss is stubble fires. Despite the stubble burning ban in Turkey such activity cannot be prevented, which in turn leads to destruction of microorganisms and

creatures that affect the chemical and physical structure of soil, and harms agricultural land and biodiversity in other ecosystems.

Problems arising from climate change

Agriculture is one of the most heavily affected sectors by climate change. The agriculture sector is very important in terms of food supply and raw material supply for agriculture based sectors, and if agricultural revenue changes this can have a huge impact on the country's economy. Limited research has been conducted in Turkey on climate change's effects on agriculture, but results estimate that product efficiency in seven geographical regions and indeed all over the country will decrease, production patterns will change depending on region, and total prosperity will decrease by 0.7% due to product price increases. Agricultural land affected by climate change can also affect climate change, depending on activities conducted on it. Greenhouse gas emissions emanating from agricultural activities in Turkey constituted 7% of total emissions in 2009. Agriculture greenhouse gas emissions emanate from activities such as agricultural production and processing, number of livestock (enteric fermentation, fertilizer management), rice production, and open burning of agricultural waste. The Agriculture Strategy (2006-2010), Aridity Combating Strategy (2008-2012), and Organic Agriculture Strategy (2006-2010) documents, prepared by GTBH, include targets for greenhouse gas emission control in agriculture, and conformity to climate change reductions in emissions. TAGEM cooperates with International Centre for Agricultural Research in Dry Areas (ICARDA) on water harvesting. Projects for determining and growing aridity resistant plants, and determining water loss in Scotch pine stands at different closure levels are conducted in Konya Karapinar and Igdir Aralik under a protocol signed between TAGEM and ÇEM.

Problems arising from soil pollution

Due to excessive use of fertilizers and pesticides to increase productivity in agricultural products, water is becoming polluted, eutrophication is increasing, and heavy metal contamination, such as cadmium found in phosphorous fertilizer, is polluting soil. While Turkey's chemical fertilizer regulations do not contain limit values for heavy metals, GTBH provides diesel oil, fertilizer and soil analysis support to identify and then prevent soil pollution that may arise from chemical fertilizers. The GTHB Strategical Plan (2013-2017) aims to develop safer plant protection applications to provide sustainable agricultural production, and monitor and control pesticides used in plant production, such as acquiring products without any residues.

A SWOT analysis for the sustainable management of agricultural lands is summarized in Table 2.5.

Table 2.5: SWOT analysis of studies to degradation of agricultural lands.

Strengths • Fields in different climatic zones suitable to grow various products; • Regulations on soil preservation and land usage; • Agricultural land is defined in geographical information system; • Qualified human resources and technological infrastructure for agricultural land management; • Hastened land consolidation and in-field development services; • Increasing support for encouraging environment friendly agricultural production; • Renewed soil pollution and environment protection legislation within EU harmonization process.	**Weaknesses** • No soil preservation and development policy despite Law no 5403; • Small scale agricultural managements and multipartite and scattered agricultural lands; • Conflict of authority between institutions about agricultural land usage; • Topographical, climactic and soil limits (organic matter, lack of depth); • Different methods and criteria are used in soil surveys and land use studies; • Lack of practical preservation tools to protect agricultural land against urban development; • Lack of up-to-date soil database; • Contradicting and insufficient legislation; • No integration to provide inter-sectoral planning for agricultural land usage; • Lack of a strong institutional structure for agricultural land management established at central or local level; • Farmers do not have sufficient information or awareness.
Opportunities • Agricultural managements registration system is started; • Increasing awareness and sensitivity about environment and preservation of water and soil resources; • Liabilities arising from international agreements Turkey has signed; • Agriculture Information System studies started; move towards efficient land management and planning; • Guiding effect from EU membership application process; • Institutions and organizations willing to cooperate; • Planning started at watershed scale; • The concept of spatial strategy planning introduced to legislation system by legislative decree (KHK) no 644, which provides opportunities for country wide whole scale planning.	**Threats** • Urban housing areas continuously and excessively growing, which puts structuring pressure on agricultural lands; • Climate change and global warming, desertification and erosion; • Fragile ecosystems due to arid and half-arid climate conditions; • Rapid migration to urban areas from rural areas; • Increasing pollution in surface/underground waters due to unconscious chemical fertilizer and pesticide use; • Exceeding safe levels of underground water use, • When establishing agriculture based industries, regional soil and water resources are not considered; • Demands to use agricultural lands out of purpose, especially from non-agricultural industries.

2.2.3. Analysis of Degradation in Pastures

There is conflicting information about the total area of pastures available in Turkey. According to TOPRAKSU etudes and evaluations (1978) the total area of grassland and pasture is 21 698 400 hectares; whereas the agriculture census conducted in 1991 shows 12 377 600 hectares. According to GTHB data covering 1998-2012 shows 9 485 536 hectares and data from TUIK in 2001 shows 14 616 687 hectares of pasture available. Among all these sources and studies, total the pasture area provided by TUIK will be used.

Despite being one of the most important natural resources and a significant ecosystem, pastures are not preserved properly, nor they are reclaimed and developed. Development Plans aim to hasten studies to determine, confine, classify and reclaim pasture, ensure more efficient and effective usage, and evaluate forage crop need with an improved product range and production. By the end of 2012, studies were completed on 14 616 687 hectares of pasture (67%), confining works completed on 9 622 720 hectares (36%), and allocation works completed on 3 065 362 hectares (21%).

Pastures, summer pastures and winter quarters are lands given to villagers who breed livestock, although ownership rests with government and at government disposal. However, a number of actions cause land degradation in pastures including permitting early depasturization, laying too many animals out, and keeping pasturing out of season. In addition there is not a credible pasture regulation body. In most of the country, pasturing is not performed in accordance with pasturing capacity or pasturing season, is not uniform nor is suitable livestock used, based on foraging type.

Between 2000 and 2012, GTHB performed 979 pasture reclamation and management projects covering 446 197 hectares of land with 4% of current pasture reclaimed. In addition to these works, 161 754 ha of in-forest pasture area was reclaimed through activity conducted by OSIB. Within the scope of the Pasture Information System Project (MERBİS) 2.6 million hectares were registered from all over Turkey. Also, within the scope of National Pasture Usage and Management Project, pasture classification, plant types, and soil erosion values were defined in 48 provinces through a TUBITAK and TAGEM collaboration. In these provinces, 1835 plant types were registered and 342 of these are classified as endemic. Pastures in the remaining 33 provinces are planned to be examined under a new project.

In addition to the above activity, soil preservation studies in pastures that are degraded due to misuse are planned to be undertaken through an OSIB and GTBH collaboration, with the aim to protect pastures from erosion and desertification. Also GTBH is conducting pasture reclamation and recovery applications within Agricultural Land Protection for Environment Program (CATAK). The “Grassland, pasture and Forage Plants Production Development Plan”, which was implemented in 2012, aims to: a) reduce over-pasturage of livestock by increasing the quality of coarse fodder production and by developing livestock breeding into a more profitable business in selected villages to improve life standards, provide rural development; b) increase forage crops growth rate in plough land to 25%; c) promote artificial

pasture growth in non-agricultural lands and degraded pastures and thus provide a larger usable area for the livestock breeding industry; and d) promote the building of facilities and structures to help pasturage to become an easier task in pastures and summer pastures.

According to TUIK data, there has been a significant rise in forage crops plantation areas. Increased animal feed production will lower the animal pressure on pastures and help prevent desertification. Forage Crops Plantation Support studies, handled within the scope of Cabinet Decisions, has been the driving force for increasing forage crops plantation areas. Within the Development Plan, it is planned to increase reclaimed pastures from 450 000 to 530 000 hectares by 2015 and 770 000 hectares by 2023; at the same time increasing forage crop areas from 2.7 million hectares to 4 million hectares also by 2023. Pastures remain vulnerable to desertification given that most of the 14.6 million hectares that needs reclamation action will not have been investigated until after 2023.

Research projects aiming to reclaim and manage pastures have been managed by TAGEM for many years. Studies for water harvesting in pastures, especially in different ecological regions, are helpful in preventing desertification. The Educated Shepherd Employment Project managed by TAGEM will ensure pasturage in pastures, and will aid prevention of degradation. Extension of these practices will enable alternate pasturing methods to be implemented to prevent early pasturing and reduce overcapacity. Preventing runoff in pastures, increasing moisture content of pastures, preventing erosion and providing plant growth are all requirements to combat desertification.

The National Pasture Management Project, run under TAGEM, includes studies in classification and mapping of pastures through vegetation studies, establishing reclamation and management models in relation to pasture types, setting social, economic and environmental benefits of pastures in the light of country needs. Projects include field studies on pasture outside of the Aegean, Marmara and Southeast Anatolia Regions.

Results from a SWOT analysis for sustainable pasture management are summarized in Table 2.6.

Table 2.6: SWOT analysis on studies to combat pasture degradation

Strong points • A countrywide spread among provinces, counties and villages; • Food, Agriculture and Livestock Organization, with strong information and experience background; • Pasture Act no 4342; • All dispositions related to pastures belong to GTBH; • Sufficient funds are granted to determine, confine and reclaim pastures, along with sufficient support funding for resources; • Strong communication and technology infrastructure; • Strong research institutions for pasture reclamation studies; • Pastures cannot be bought or sold as private property or misused, they can only be leased; • Cooperation with OSIB under protocol, for pasture reclamation works; • Educated herding project in practises and training are intensified.	**Weak points** • Pressure to balance misuse and preserve and use cultivated and pastures; • Insufficient preservation and reclamation for pastures and grassland, and forage crops growth; • Insufficient reclamation works in grasslands and pastures; • Insufficient number of technical staff working on pastures; • Insufficient pasture management plans, and communication with users is not at desired level.
Opportunities • Technical developments in pasture reclamation; • Increasing number of research projects about pasture management.	**Threats** • Conflict between Pasture Act no 4342 and Article 4 of Construction Zoning Law no 3194, which permits construction works on pastures; • Increased pressure for construction on pastures, due to lack of land usage plans, despite application of Soil Protection and Land Use Law no 5403; • Negative effects caused by climate change; • Uncontrolled and unregulated open herd pasturage.

2.2.4. Analysis of Degradation in Natural Ecosystems

Turkey is very rich in types of ecosystems and habitats and biodiversity values, and is in a very special position among the countries located in this mild climate zone. Primary reasons for this richness are Turkey's geographical position, and its geological and topographical features. Being surrounded by seas on three sides, having mountainous areas, inner lands that are isolated from the marine climate because of high mountains can be counted among reasons for this richness.

Turkey is located between Mediterranean, Siberia-Europe and Iran-Turan phytogeographical regions. These properties put Turkey into 3 out of the 34 most prioritized biodiversity hotspots in the world: namely the Caucasia, Iran-Turan and Mediterranean hotspots. Plant richness extends to approximately 10 thousand species and animal richness to approximately 80 thousand species in Turkey, almost a third of which are endemic. The extent of this natural richness can be observed in various habitats in Turkey; primary examples being forests, grasslands and steppe, heath land and brushes, mountainous areas, wetlands, rivers and coastlines.

An effective and traditional method to protect the natural ecosystems and the biodiversity they host is to pronounce and manage conservation areas. The number of conservation areas governed and managed by the Ministry of Forestry and Water Affairs was 952 in 2002, raised to 1760 by 2013. Over this period the amount of conservation land has been increased from 3.4 million hectares (4.3% of country surface) to 6.3 million hectares (8.1%).

Alongside these riches, and like the rest of the world, Turkey's natural biodiversity is facing challenging problems, and some species and habitats are endangered. For example, most of the aforementioned habitats are severely degraded and this degradation is increasing. One of the main reasons for loss of these natural amenities is that country's lands have long been in human use. Production in natural lands has been going on for millennia, and the rate of use is accelerating due to increasing population and consumption habits. More especially, development focus in the last 50 years has affected natural areas and species strongly.

The situation on Turkey's forests was covered thoroughly in section 2.2.1. 60% of Turkey's forests are coniferous and 40% broad leaved, and Turkey has two endemic tree species, namely Sweetgum (*Liquidambar orientalis*) and Datca Date (*Phoenix theoprastii*). Despite the significant improvement and increase of forests in Turkey, reclamation of forest land still constitutes a significantly high portion of forests available. Most important problems our forests are facing include erosion, pasturage, illegal cutting, forest fires, housing developments, opening cultivation lands and pollution.

Another important habitat for biodiversity in Turkey is heath lands and brush formations. Today heath lands are not given priority in conservation, and in forestry terms they are defined as degraded. Located mostly in south, west, and northwest parts of Turkey, these formations are facing a serious loss of habitat. There is a dire need for an inventory study to determine the extent and function of heath lands and brush formations.

Steppe are also among the most common habitats in the country. Steppe habitats in Turkey are located mostly in Central, East and Southeast Anatolia regions. Some of Turkey's steppe are natural (e.g. plains in Inland Anatolia and Southeast Anatolia, and low plains in East Anatolia), while some have been converted to steppe over time by human intervention (Anthropogenic steppe). For example, there were once forests of oak and black pine

surrounding the plains, and with human intervention these areas degraded into areas known as mountainous steppe.

Most of the steppe in Turkey bear pasture characteristics and are used for pasturage. Steppe have been degraded or their characteristics have been changed in the past hundred years, due to conversion to agricultural lands and excessive pasturing. Biodiversity preservation approaches should be integrated into pasture planning for steppe habitat, and action plans should be prepared and implemented to protect endangered species.

Steppes, and the biodiversity they host, are not represented properly in Turkey's conservation network. Special environmental conservation areas around Salt Lake and a wildlife protection site in Urfa Kizilkuyu are the best known steppe conservation sites. Action plans for these areas include activities to improve management efficiency in steppe protection.

Turkey has a very mountainous structure because of its geological position. This structure adds to the riches of endemism, especially in plants, and especially in the Taurus Mountains and Black Sea Mountains, which are significantly rich in this context. The main reasons for degradation of mountainous ecosystems are excessive pasturage and erosion, but demand for transport and mountain and snow sports has increased in recent years, along with increased demand for settlement structuring and transport infrastructure, all affecting mountain ecosystems negatively.

One of the richest biodiversity and yet most fragile ecosystems in Turkey are river and wetland systems. Turkey consists of 25 watersheds, has more than 100 rivers and 135 internationally important wetlands, 13 of which are special conservation areas under the Ramsar Convention. Almost half of country's wetlands became partially degraded or lost completely in the last half century. Desiccation to reduce malaria, agricultural land conversion activities, construction of dams, hydroelectric power plants and water delivery lines, along with industrial, agricultural and drinking water reallocation are the main reasons for this destruction. All current wetlands are protected with efforts made in recent years to prepare conservation plans for the management of wetlands. Despite this some of Turkey's wetlands are still problematic primarily because they can't get enough water to meet their needs. The quantity of water going into wetlands decreased due to increased aridity from climate change and proliferation of farming irrigation. Water flows cannot be maintained because water release periods (e.g. from hydroelectric power) do not match natural periods. DKMP and DSI are running various restoration projects to rehabilitate degraded wetlands, and these positive efforts are essential to maintain important wetland ecosystems.

Another important land habitat are coastal zones. Turkey's coast extends to 8300 km, with some parts of this coastline under secondary residence and tourism construction threat. Coastal erosion is another threat. Turkey's coastline is very important for sea turtles, with 15 sea turtle breeding zones identified on southern coasts. Turtle mating periods typically coincide with the tourism season, which has caused some problems from time to time, but

serious steps have been taken in recent years, with appropriate precautions and monitoring programs put in place.

Currently, there are various mechanisms for conservation of natural areas and species. Remarkable efforts have been made, such as conservation areas, species-specific studies and efforts to protect certain habitats. Yet all these efforts are not currently sufficient to prevent degradation in natural areas. Strategies prepared to protect natural values and required political and legal infrastructure needs to be improved further from its current state. Protection activities should be increased, along with the quantity of conservation areas, administration mechanisms should be improved to be more efficient, and conservation approaches should be integrated to all sectoral processes.

This strategy and action plan provides various approaches to efficiently integrate nature protection in forestry and agriculture sectors, and provides suggestions to improve protection activity in prioritized natural areas. Integrating efforts for combating desertification and land degradation into biodiversity protection and efforts to combat climate change are essential to achieve success in all these fields. Section 4.2.1 provides further information on coordination activity on these subject areas.

2.3. Partners and Institutional Capacity, Legal Frameworks, Finance, Policy, and Science and Technology on Desertification and Land Degradation

2.3.1. Partners and Capacity for Combating Desertification

Core factors which determine the fate of desertification and land degradation processes result from the activities and practices undertaken by people or institutions who own the land, and the approaches, plans and capacity they have to implement actions. Practices undertaken by an institution to achieve their institution-targets may be well-meaning within their own limits but, in a wider context, may cause land degradation unless their activities include wider and different disciplines and targets. As an example, intensive farming or irrigation farming may increase local people's income within a region, but if necessary precautions are not taken or incorrect approaches are chosen, limited actions may pose a threat to the long term sustainability of agricultural production. This example is not limited to farming and may be reproduced in different sectors.

Addressing practices within institutions with regards to desertification and land degradation, conservation of biodiversity and prevention of climate change impacts, and change implementation, are very important. Such transformation is a large undertaking, requiring changes in institutional structures, and increased capacity with support through legislative changes. In addition, social and economic transformation of local people who utilise land for different purposes is also very important. Relevant institutions should be required to provide support for people to switch to a management system using sustainable methods. A key factor will be to implement all these changes and practices using a strategic approach, through cooperation and development of a plan.

Many institutions in Turkey have responsibility for and authority on desertification and land degradation, but works are conducted primarily through three ministries: the Ministry of Forestry and Water Affairs, Ministry of Food, Agriculture and Livestock, and the Ministry of Environment and Urban Planning. Within these three Government institutions, there are various general directorates each having specific responsibilities.

The authorized institution in Turkey for overall coordination of desertification and land degradation activity is the General Directorate of Combating Desertification and Erosion (ÇEM) located under the Ministry of Forestry and Water Affairs. This Directorate is Turkey's focal point for the United Nations Combating Desertification Agreement. Established in 2011, the primary duties of ÇEM are soil preservation, natural resources' development, combating desertification and erosion, determining policies and strategies to control activities against avalanches, landslides and floods and developing plans and projects for this, ensuring coordination and cooperation between relevant institutions and organizations, and conducting research and development (R&D) studies.

Since its establishment, ÇEM conducted many activities to develop policies and strategies, and projects for combating desertification and land degradation. These include:

1) Establishing an effective monitoring-assessment system to monitor desertification and erosion in Turkey;
2) Carrying out integrated watershed management studies;
3) Increasing the technical capacity both inside and outside the institution regarding desertification and land degradation;
4) Carrying out dual and regional international collaboration projects;
5) Establishing and carrying out development and application projects in Central Asia, Middle East, Africa and Balkan countries;
6) Creating application examples for sustainable land management (SLM) approaches in Turkey and integrating this approach in to current planning and management processes;
7) Preparing and carrying out plans and programs to combat erosion;
8) Carrying out income generation activities for regional people under integrated projects to provide rural development;
9) Establishing the means and carrying out development of various strategic and activity plans to carry out all these works systematically and according to plans.

Strategy and action plans prepared by ÇEM are:

1) Action Plan to Combat Erosion (2013-2017);
2) Green Belt Action Plan for Afforestation of Dam Watersheds (2013-2017);
3) Action Plan for Rehabilitation of Mining Zones (2014-2018);
4) Action Plan for Upper Watershed Flood Control (2013-2017); and
5) National Watershed Management Strategy (2014-2023).

Also, the General Directorate published two separate guides on desertification and land degradation recently; a Guide for Afforestation in Arid and Semi-Arid Areas and Erosion,

and Global Guide for Restoration of Degraded Forests and Landscape in Arid Areas. It also supported publication of the "United Nations Guide for Establishing Climate Change Resistant Landscapes in Arid Areas" in close cooperation with UNCCD, FAO and UNDP. Also, efforts have been made to establish a Conference on Interaction and Confidence Building Measures in Asia (CICA), at the International Research and Training Centre on Combating Desertification in Konya.

The General Directorate of Forestry is one of the oldest organizations in Turkey and is responsible for managing and operating the country's forests. With a strong local organization, OGM is able to conduct many of its studies on prevention of desertification and land degradation in the field. In recent years, studies on combating climate change and preserving biodiversity have been increasing, and the institution has been undertaking key responsibilities on desertification and land degradation too. OGM is also in charge of in-forest pastures management and reclamation, and implementing necessary precautions for the conservation of other pastures in collaboration with the Ministry of Food, Agriculture and Livestock.

Ministry of Food, Agriculture and Livestock is the competent authority regarding desertification and land degradation in agricultural lands and pastures. Important parties of the subject under the ministry include General Directorate of Agricultural Reform, General Directorate of Vegetative Production and General Directorate of Agricultural Research and Policy (TAGEM). Many of the studies regarding prevention of degradation in agricultural land and pasture are performed within these units of the Ministry and their research stations.

Two further General Directorates in the Ministry of Forestry and Water Affairs, who participate in desertification and land reclamation activity are the State Hydraulic Works (DSI) and the Water Management General Directorate. DSI is responsible for planning, managing, developing and operating all of Turkey's water resources. Its primary duties include overflow protection, intensification of irrigation for farming, hydroelectric energy production and providing drinking water for cities. DSI's authority extends to underground water supply research, well digging, and allocation, registration and protection of water resources. DSI is one of the key institutes with regards to soil erosion, overflow control and management of over and underground water sources management related to desertification and land degradation.

The Water Management General Directorate's duties include:

1) Protecting and improving water sources, and determining policies for their usage;
2) Preparing river watershed management plans to protect and develop water sources;
3) Determining and implementing measures to prevent pollution to watersheds, in collaboration with relevant institutions and organizations;
4) Establishing strategies and policies regarding overflows;
5) Preparing overflow management plans; and
6) Facilitating necessary coordination about allocation of water sources on a sectoral basis in accordance with river watershed management plans.

The Water Management General Directorate completed watershed Protection Plans in recent years and studies for preparing River Watershed Management Plans have started.

The General Directorate of Vegetative Production is responsible for developing and intensifying organic agriculture and good farming practices in the context of prevention of desertification and land degradation. It is also responsible for:

1) Intensifying appropriate fertilizer use based on soil analysis;
2) Determining and developing watersheds and conducting management studies;
3) Establishing watershed based production policies;
4) Facilitating increases in organic agriculture production, efficiency and quality via research on water, soil, environment, climate change, cultivation techniques, harvest and storage;
5) Conducting studies to increase efficiency in agriculture to combat rural poverty;
6) Determining, confining and allocating pastures, summer pastures, winter quarters and public grassland and pastures; and
7) Increasing production of perennial forage crops and efforts for establishing artificial pastures.

General Directorate of Agricultural Reform plays a significant role in desertification and land degradation activity by:

1) Preparing land usage plans;
2) Preservation and reclamation of agricultural land, and identification of erosion sensitive areas;
3) Establishing a support database to prevent misuse;
4) Determining areas to be used with non-agricultural purposes and potential usable areas where detailed soil surveys have been conducted;
5) Preparing climate maps, soil maps and climate types using geographical information systems, by land usage changes and greenhouse gas emission calculations, and monitoring groundwater and saltiness in problematic lands by performing assessing and applying drainage projects;
6) Applying techniques that minimize water consumption in plant growing and modern irrigation techniques, and
7) Conducting crop rotation with suitable species.

With units under its authority and subsidiary research institutions, the General Directorate of Agricultural Research and Policy takes necessary precautions for:

1) Combating aridity, erosion, desertification, and negative effects of salinity, soil and water pollution;
2) Developing applicable reclamation methods;
3) Ensuring usage of various wastes in agriculture without damaging soil;
4) Facilitating biological fertilizer development and use;
5) Developing integrated combat and prediction warning systems;
6) Preserving and developing local gene sources;
7) Ensuring water savings by assessing outcomes of climate change and related activities in watersheds;
8) Ensuring re-use of water in agriculture;

9) Conducting research on the possible use of water saving systems in agriculture, by establishing irrigation programs;
10) Preserving water sources;
11) Determining agricultural aridity areas and preparing risk maps;
12) Performing aridity risk analysis;
13) Conducting research on soil moisture estimation and keeping soil moisture in place.

Among these institutes, Konya Soil, Water and Combating Desertification Research Station Directorate serves as an exemplary institution at the Karapinar erosion site, conducting dilution studies on erosion and aridity within a laboratory dedicated to combating desertification. A protocol has been signed between Konya Soil, Water and Combating Desertification Research Station Directorate and the Ministry of Forestry and Water Affairs General Directorate for Combating Desertification and Erosion, which enables mutual application of R&D studies under the TAGEM. Projects on issues such as biodiversity, preservation of natural resources, and determination of plant species resistant to semi-arid areas will be conducted under this protocol.

Along with many other duties, the Ministry of Environment and Urban Planning is the core institution for high level planning. Within the Ministry, the General Directorate of Spatial Planning has an important position in this regard. Planning is one of the core elements that will determine how desertification and land degradation issues will progress. Within this context, the institution currently prepares environmental plans and integrated coastal zone plans, and is preparing to begin spatial strategic planning studies shortly, which will put in place a higher level planning vision for Turkey. Active participation of General Directorate of Spatial Planning in combating desertification and land degradation studies is essential.

In summary, Turkey's institutional structures mean it has the capacity and equipment to combat desertification and land degradation. Both the central and local organizations, their institutional expertise and experience of these institutions is sufficient to manage the situation. By taking some basic steps, such as ensuring cooperation and collaboration within and between these institutions, such as constantly improving institutional and staff capacity on recent innovative developments around the world, and by determining and addressing overlapping authority and responsibility between institutions, Turkey's capacity and ability to combat desertification and land degradation will increase and studies will become more efficient. Development of institutional structures, capacity increases and cooperation issues are prioritized in this Strategy and Action Plan, and required that planning is done for different strategic objectives.

2.3.2. Legal Framework

One of the most important components in successfully combating desertification and land degradation is to have and efficiently apply a sufficient legal framework. While the issue is directly related to institutions' duties and capacities, the legal framework is an important aspect in providing capacity to combat desertification and land degradation. For this reason

one of the international priorities of UNCCD is to make sure national frameworks provide the environment for such efforts.

Turkey already has a strong set of laws to administrate and reclaim production areas such as forests, agricultural land and pastures. For example:

1) **Forest Law no 6831** governs the preservation and operation of the country's forests, while also governing property rights in forests. This law sets out the mechanism for efficient management and improvement principles for forests, and provides opportunities to improve the quality of life of villagers living in or around forests.

2) **Soil Protection and Land Use Law no 5403** sets out the principles to prevent loss of soil through natural or artificial means or loss of quality. In doing so it identifies preservation and development of soil and planned land use in accordance with sustainable development as key requirements. The law also includes determination and classification of land and soil resources using scientific methods, preparation of land usage plans, using participatory methods the assessment of social, economic and environmental aspects in preservation and development process, prevention of incorrect use and misuse, and determination of methods for preservation. Currently the efficient implementation of all articles of the law has not yet been fully achieved and land use plans (Article 10), determination and preservation of plains with high agricultural potential (Article 14), determination and preservation of erosion sensitive areas (Article 15) have not been efficiently put in practise, despite being enacted in the law.

3) **Pasture Act no 4342**, aims to determine, confine and allocate pastures, summer pastures, winter quarters and publicly owned grassland and pasturage to village or municipality legal entities, ensuring usage of such lands in accordance with defined rules, increasing and improving their efficiency via maintenance and reclamation works, continuously inspecting and protecting their use and change of usage when deemed necessary. Since coming into force in 1998 the focus has been on determining, confining and allocating pastures.

4) **Agriculture Reform Regarding Land Arrangement in Irrigation Areas Law no 3083** is implemented to ensure efficient use and preservation of soil, acquiring economic efficiency from unit areas, providing land provisions to farmers without land from government owned territory, and providing support and train to them, when necessary and if possible. In addition the law consolidates agricultural lands segregated into larger section when the said land sections are unavailable for economical production, prevents partition of lands into pieces, which are insufficient to provide for a family. To prevent the most important agricultural problem countrywide, related to land partition, significant efforts are made in land consolidation and in-farm development services. While in many European countries third generation land consolidation works are completed, even first generation consolidation works are not finished in Turkey, which is proof that more focus should be placed on this issue.

Another important priority in desertification and land degradation is the need for high level planning. These are defined under law and through regulations, which are detailed in Table 2.7.

Table 2.7: Basic legislations concerning desertification and land degradation

Name of Legislation	Content of Legislation
Soil Protection and Land Use Act (5403)	Planned land use in accordance with soil preservation and development, and sustainable development with environmental prioritization principles.
Agriculture Act (5488)	Determining necessary policies to support and develop agriculture sector in accordance with development plans and strategies.
Forest Act (6831)	Preservation, sustainable management and exploitation of forests.
Pasture Act (4342)	Determination, confining and allocation of pastures, summer pasturage, winter quarters and publicly owned grassland and pasturage to village or municipality legal entities, agistment, maintenance, reclamation and management of these.
Environment Act (2872)	Preservation of the environment, which is a common asset for all living things, under sustainable environmental and development conditions.
Organic Agriculture Act (5262)	Taking necessary precautions to develop organic products and inputs, to provide consumers with reliable and quality products.
Agriculture Reform Regarding Land Arrangement in Irrigation Areas Law (3083)	Land provision for farmers without land, in-farm development services, organizing land consolidation works.
National Parks Law (2873)	Selecting and defining national parks, nature parks, natural monuments and nature preservation areas to national or international standards, preserving, developing and managing these without harming their special properties.
Underground Waters Law (167)	All kinds of research, exploitation, use and registration of underground waters.
Afforestation Regulation	Afforestation, rehabilitation, erosion and flood control, avalanche and landslide prevention, pasture reclamation, tree reclamation, seed and sapling growth for forest trees, shrubs and flora, managing nursery and amelioration.
Good Agricultural Practices Regulation	Ensuring an agricultural production without any harm towards environment, human or animal health, preservation of natural resources, ensuring traceability and sustainability, and supply of reliable products in agriculture.
Soil Pollution Control and Point Source Pollution Sites Regulation	Prevention of soil as receiving environment, determining sites and sectors where there is pollution or risk of, defining principles for monitoring and cleaning polluted soil or sites in accordance with sustainable development.
Domestic and Urban Domestic Sludge Use on Soil Regulation	Defining principles of taking precautions for sewage sludge use on soil in accordance with sustainable development.
Organic Agriculture Regulation	Preserving ecological balance, conducting organic agriculture practices, administrating organic agricultural product and marketing of, and intensification.
Wetlands Preservation Regulation	Preservation and development of wetlands, especially to practise Internationally Important Wetlands as Water Birds Habitat Agreement (Ramsar Convention), and ensuring cooperation and collaboration between institutions in charge of these subjects.

When combating desertification and land degradation the laws in Turkey individually and as a whole provide sufficient means and tools. However, some exceptions exist in these laws, and there is some overlap between different regulations that may create practical gaps or conflicts, and this can act as an obstacle in combating desertification and land degradation. For example, while preservation and development of agricultural land is governed through the Soil Protection and Land Use Act no 5403, Article 5 of this law, titled "Soil Protection Board" concerning the structure and working system for the Soil Protection Boards, do not allow equal representation. Since transparent decision making will not be possible, even with regard to public welfare, it is possible that a change in qualification and practices of fertile agricultural land might be permitted that may result in degradation of these lands. Also, due to contradictions between agricultural land and pasture preservation legislations and construction zone legislations, agriculture and pastures are open to being re-structured for a different use. These contradictions should be addressed to prevent structuring in agricultural lands and pastures.

2.3.3. Finances and Incentives

2.3.3.1. Forestry Sector

The current budget and financial capacity of the General Directorate of Forestry (OGM) is quite sufficient and relatively high compared to many countries. For example, a financial investment of 300 million TL was used for afforestation works conducted in 2012 and 2013 by OGM. Three quarters of OGM income is derived from their own activity, most of which comes from wood sales and income from permits given in forests. Thus, significant and sufficient funds can be allocated for the preservation and afforestation of forests and development of degraded forest areas. The forestry sector is, however, subject to crises happening from time to time, including within in the forest products industry or through nationwide economic difficulties, and the sector may face financial bottlenecks at times of crises. Despite the legal regulations (e.g. National Mobilization for Afforestation Law and Regulation) concerning other state institutions' and shareholders' financial participation in afforestation, such participation was not at desired levels in past years. With the help of precautions taken in the recent years, however, and significant efforts placed on afforestation and sapling planting by local people and other shareholders, means activity have increased significantly. This is especially so between 2008 and 2012, when targets set under the Action Plan for Afforestation and Erosion Control Mobilization were fully met.

It may be possible to develop creative income sources, such as payments for ecosystem services like carbon sequestration and protection and administration of water sources considered to contribute to sustainable management of forests, these are not expected be realized in the short term.

Incentives to support and encourage participation by forest villagers and other shareholders, in the preservation and sustainable development of forests, have a long history in Turkish forestry. The current system consists of five main incentive mechanisms:

1) Covering firewood and construction wood needs of forest villagers at discount prices;
2) Incentives to encourage forest villagers to participate in forests' preservation:
3) Special afforestation incentives;
4) Support and incentives to improve life quality and subsistence of forest villagers; and
5) Incentives for forest villagers to exploit non-wood forest products.

Within this context, firewood and construction wood needs of rural populations living in or around forests are granted as legal rights in accordance with relevant clauses of the Forest Act No. 6831. Approximately 4.5 million m^3 wood (4 million m^3 as firewood) is provided to forest villagers at discount prices annually, representing 24% of total wood production from forests in 2011, for example. The annual subvention provided by OGM to forest villagers in this context is estimated to be approximately 220 million TL. 65% of this is to cover firewood needs, and 35% is to provide them income through sales. Partial preservation, maintenance, rejuvenation and afforestation of forests are granted to forest legal entity via a contract, including the abovementioned rights.

In addition, forest villagers and cooperatives are granted credit support with low interest rates by the General Directorate of Forestry - Rural Affairs or ORKÖY. Part of this support aims to decrease excessive wood consumption and improve life conditions of people (e.g. credit support for roof covering, cooking stove, solar power, house isolation and so on) and the other part aims to increase income through diversification (e.g. beekeeping, barn stockbreeding, orcharding, mushroom production, seedling production, handcrafts, storage and processing facilities, ecotourism, and so on). First category credits are classified as social development support credits, and second category credits are for economic development. Social support credits have an interest rate of zero, whilst economical credits have very low interest rates. 84% of these credits are personal (household) loans, and 16% are cooperative credits. At the end of 2012, according to the ORKÖY registry, the number of supported households was 422 200, and number of cooperatives supported was 546, which correspond to 21% of total forest village households.

According to current legislation, collection and sales of non-wood forest products (ODOU) are granted to local forest villagers in return for very low fees, except for a certain few products. Annual ODOU production was estimated to be approximately 37 million tonnes in 2012 and according to OGM estimations, forest villagers earn approximately 89 million TL from such products, corresponding to 35.6% of total value acquired from ODOU. Income acquired through ODOU sum up to only 1.1%, and the rest is acquired by intermediaries, processors and tradecrafts.

Special afforestation incentives in Turkey include special land allocations, low interest loans, and grants. All wood and non-wood products acquired from such sites belong to the grant holder. Those who timber on their own land will be free of land tax for 50 years. According to OGM records, private afforested area was approximately 120 000 ha by 2012. 73% of these plantations were developed in the last 25 years, 53% were in the last decade, and

approximately three quarters were conducted in degraded forest lands. 20% were public property, and 5% were on private land. 72% of the financial support provided was for fruit tree types, although 56% was for three fruit tree types only; namely almond, nut pine and walnut. Afforestation sites where forest tree were planted sum up to only 20%. The General Directorate of Forestry continues to provide support for income providing species, such as almond, walnut, and locust tree, under specific action plans. Grants given for these species only in 2013 was 2 527 258 TL. Support and incentives provided for private afforestation is provided in Table 2.8.

Table 2.8: Area, grants and loans provied for private afforestation efforts between 2009 and 2013.

	Unit	2009	2010	2011	2012	2013
Private afforestation	Hectares	9535	17 306	8566	4944	1975
Grants	000's TL	3017	2826	3590	1877	2527
Loans	000's TL	8756	11 131	10 659	8567	8841

Economic support provided to the forestry sector under current incentives are at significant levels, totalling 380 million TL; and rather than increasing this amount, there is a necessity for appropriate assessments and regulations that will make for more effective use of current support. Generally, assessments for incentive applications made according to input-output indicators (e.g. amount of credit given to number of families) and monitoring and evaluation based on results and outcomes (e.g. less pressure on forests, increase in people's income and life quality, effects on migration) is insufficient, and therefore these need to be focused upon and developed.

2.3.3.2. Agriculture and Livestock Sector

GTHB provides agricultural support to extend environmentally friendly agricultural production, to support combat against diseases and harmful pests threatening vegetative production, to increase efficiency and quality, to contribute to solutions for priority problems faced by the sector, to ensure sustainability, and to maintain agricultural records. Financial support provided for these purposes can be summarized as:

1) Diesel, fertilizer, and soil analysis support;
2) Deficiency payments according to Turkey watershed production and support model;
3) Husbandry support (e.g. for bovine, ovine, beekeeping, water products, and quality forage crops);
4) Herd breeder employment support;
5) Support for using domestic certified seed, certified seedlings and standard seedling use, and domestically certified seed suitable for plant production according to quality, technology use and environment priorities in compliance with sustainability principles;

6) Support provided for farmers registered on the National Registry of Farmers for vegetative production and on the Organic Farming Information registry for organic farming, including organic farmers raising bovine, ovine, bees and water products;
7) Support provided to farmers for good agriculture practices;
8) Support for decreasing chemical compound and pesticide use, and increase and extending biological and biotechnical combat against harmful pests occurring in greenhouses or open air vegetative production;
9) Support for stubble drills and other agricultural machinery and equipment to decrease soil processing;
10) Support provided to agricultural enterprises meeting the criteria for joining the agricultural advisory system to develop agricultural publications and advisory system into a freely available structure;
11) Support provided to approved research-development projects and researchers to develop information and technologies most needed by the agriculture industry and deliver this to farmers and agricultural industrialists.

After 2004, certain conditional area-based payments have been implemented at various times to manipulate production, in areas such as organic agriculture, good agriculture practices, soil surveys, preservation of soil and water quality in agricultural lands, sustainability of renewable sources, and Environmental Preservation of Cultivated Lands (CATAK) to reduce the negative effects of heavy agricultural activity. Many projects have been supported through CATAK; to ensure sustainability of natural sources, suitable soil processing, fertilizing, extending modern irrigation and similar culture measures, for preventing erosion and raising awareness among producers about agriculture-environment issues. A new system named Watershed Based Support Model has been implemented by Cabinet Decision no 2010/159, and premium payments have started within 30 agricultural watersheds. GTHB is set to provide 9.8 billion TL support for agriculture in 2014.

The Vegetative and Animal Agriculture Production with Ecological Methods Regulation came into force in 1994. The law regarding organic agriculture was prepared as part of European Union harmonization process as the Organic Agriculture Act no 5262 dated 2004. Organic Agriculture Essentials and Practice Regulation dated 2005, and based on abovementioned law, were extensively amended in 2008. The level of organic agriculture is rising in Turkey (Table 2.9), and is gaining value in terms of both exports and domestic consumption. There are organized NGOs and individual organic agriculture producers in Turkey. GTHB prepared the Organic Agriculture Strategy Plan of Turkey (2012-2016) to support organic agriculture and good agriculture practices; this plan also aims to establish inter-institutional coordination, and economic, efficient and effective use of resources. The basic principles of organic agriculture are defined in the Organic Agriculture Essentials and Practice Regulation, which was drafted in its final form in 2010.

Table 2.9: Organic vegetative production changes between 2005 and 2012 (TUIK, 2012).

	Number of products	Number of farmers		Area[1]		Production	
	(n)	(n)	(% change on previous year)	(Hectares)	(% change on previous year)	(Tonnes)	(% change on previous year)
2005	205	14 401	-	203 811	-	421 934	-
2006	203	14 256	-1.0	192 789	-5.4	458 095	8.6
2007	201	16 276	14.2	174 283	-9.6	568 128	24.0
2008	247	14 926	-8.3	166 883	-4.2	530 224	-6.7
2009	212	35 565	138.3	501 641	200.6	983 715	85.5
2010	216	42 097	18.4	510 033	1.7	1 343 737	36.6
2011	225	42 460	0.9	614 618	20.5	1 659 543	23.5
2012	204	54 635	28.7	702 909	14.4	1 750 127	5.5

Turkey started giving Good Agriculture Practices (ITU) Certificates from 2007, in compliance with provisions of Good Agriculture Practices Regulation. ITU aims to ensure an agricultural production that does not cause harm to environment, human or animal health, preserves natural resources, facilitates traceability and sustainability in agriculture, and provides a reliable product supply. ITU was applied to 5360 hectares in 18 provinces with 651 producers in 2007, which increased to 78 174 hectares (1358% rise) in 48 provinces with 4540 producers by 2015. 2023 projections aim to increase number of provinces, in which ITU is applied, to all 81 provinces.

GTBH provides diesel, fertilizer and soil survey support to prevent soil pollution arising from chemical fertilizer use. As published in official gazette no 27075 dated 5 December 2008, support is provided to farmers registered in National Registry of Farmers (CKS) and GTHB paid 3.5 billion TL for fertilizer support between 2005 and 2012.

From January 2014, for a 6-month period and with a budget of 300 000 Euros, GTHB ran the "Application of Nitrate Directive in Turkey Project" which was funded through IPA-I (Instrument for Pre-Accession Assistance). The aim of the project was to fulfill the requirements of EU Nitrate Directive, and to reduce pollution caused by agriculture, and part of this activity included strengthening GTBH capacity". Up to now, legislation adaptation works were finalized, nitrate polluted sites were piloted, monitoring studies were carried out in 3100 underground and above ground stations, and good agriculture implementations code for nitrate sensitive areas were defined. In 2018, negotiations are expected to start.

Agriculture insurance procedures and principles are defined in the Agriculture Insurance Law to ensure any losses producers have to endure are covered. The Agricultural Insurance Pool (TARSIM) has been established under law and 50% of insurance premiums farmers have to pay is supported. The extent of the risk for the Government Supported Agriculture Insurance

programme managed by TARSIM expanded much faster than other countries' applications and as a result of this, an increase of 12% in domestic premiums was observed in 2010.

2.3.4. Policies and Strategies

In an environment where studies for combating desertification and land degradation do not receive sufficient political support, putting solutions and approaches into practise will not currently meet expectations. Political desire and a defined implementation period supported through legal mechanisms are key to achieve desired impact. Raising awareness and interest at all levels, spreading information which shows that activities developed to combat desertification and land degradation will not only improve the land but also contribute to the prosperity of the people, is very important to trigger political will.

Efforts to combat desertification and land degradation and erosion will spread in the long term in Turkey. It is a subject that has become more frequently discussed, especially after Turkey became a signatory to the UNCCD, since which public enterprises have discussed the issue more strategically. Not least this includes the establishment of the General Directorate of Combating Desertification and Erosion in 2011 for this purpose and it is this Directorate who undertake coordination of the activity.

The political background in combating desertification and land degradation in Turkey feeds from development of five-year plans. The Development Plan from 2014 to 2018 includes the necessity to combat desertification, for example, stemming from the first strategy called the Combating Desertification National Action Program in 2005. The action program establishes the basic requirements for combating desertification, and sets the tools to integrate this approach to other sectors, and within their respective strategic and action plans.

Combating desertification and land degradation is becoming increasingly important as a priority in Turkey, and studies and resources focused on this issue and sharing of the country's experience in this field, and contributing to global combating efforts, are also increasing. Turkey is establishing dual and multi-party collaborations with other regions, including Africa, the Middle East and Central Asia, both for information sharing and financial support. Turkey also plays an active role in studies conducted under UNCCD, and actively supports various processes including attendance at Parties Conference.

Turkey is well developed in terms of institutional structuring and developing relevant legislation. Specific evaluation of institutional capacity and legislation are provided in previous sections. It is nonetheless key to note that issues combating desertification and land degradation and aridity are implemented through various strategical plans and action plans. These include, for example, the National Biological Diversity Strategy and Action Plan prepared within the scope of United Nations Convention on Biological Diversity; and the National Climate Change Action Plan prepared within the scope of the United Nations Framework Convention on Climate Change. The National Capacity Action Plan (see section 4.2.1) was prepared and carried into effect to coordinate these agreements under the scope of

the National Capacity Assessment Study in 2011. The most important examples of other national strategy and action plans that address and contribute to desertification and land degradation in Turkey are given in Annex 4.

Politically, combating desertification and land degradation is a priority subject for Turkey, yet there remains a large amount of work to complete. Especially at domestic level, where larger groups of people and decision makers need to internalize this issue, where legal and financial support for combating efforts should be increased, and most importantly, where coordination between institutions should maximized to make current efforts more efficient. This Combating Desertification Strategy and Action Plan sets forth a vision and road map for these purposes. Policy making, finance, capacity increase, coordination and harmonization establish the basic elements of the plan, and these approaches are supported with communication and awareness raising efforts.

2.3.5. Science and Technology

Scientific and technological advancements and innovative approaches are most important tools for combating desertification and land degradation in ever-changing conditions. Conditions in the world change as a consequence of increasing population, changing climate and consumption habits. Demand for food is increasing while production fields are degraded and efficiency of production is dropping, whilst changing climate and degraded ecosystems have a negative effect on the production process. It is very important to support scientific research and technological developments, and to deliver results and tools to producers via international cooperation, government policies and capacity increase processes, which need to follow similar paths. Published articles and scientific research on desertification and land degradation, and their societal and economical effects, is not well developed nationally or internationally, given that such effects from desertification only really started in the 1980s. Despite the fact that development of aridity and climate change resistant plant types, researching traditionally used local seeds and reinstating and intensifying their usage, and providing renewable energy potential to local people instead of using fossil fuel sources are areas where significant improvements are observed, none of these are at sufficient levels to completely eliminate the causes of desertification and land degradation or to improve production to desired levels.

The General Directorate of Combating Desertification and Erosion is undertaking a lot of R&D studies and model development and putting these into action to combat desertification and land degradation. Highly developed technological approaches are required to efficiently and closely monitor desertification, land degradation and aridity fluctuations, for example. An effective monitoring and assessment system will identify priorities and whether the studies and works implemented are successful or not. For this reason Turkey is prioritizing monitoring and assessment studies, and achieving significant developments in these fields. Most important of these is the Watershed Monitoring and Evaluation System (HIDS) developed by TUBITAK on behalf of ÇEM. This system aims to determine and monitor

desertification and sensitivity levels of watersheds countrywide. Details of the monitoring and assessment studies are given in section 4.1.

Efforts to combat aridity, diseases, pests and forest fires have been running for many years within the scope of efficient management of Turkey's forests. These studies conducted by OGM and forestry faculties of universities are reflected in forestry activity and progress achieved. Turkey has a long history of forestry works, having started during the Ottoman era when the Forest Administration was established in 1839. Further progress was achieved when the first Forest Act of the Republic era was introduced in 1937 and the General Directorate of Forestry was established, using scientific research in Universities to set the necessary standards for forestry activity. The General Directorate of Forestry established its first R&D unit in 1952 and today there are 12 forestry research institutes, nine at a regional level and 3 nationally. Since R&D studies are aimed at protecting and developing forests, and their sustainable and efficient exploitation, these fields of study are both directly and indirectly related to combating desertification.

Pasture reclamation, identifying species that will combat erosion, improving life standards of forest villagers, fighting forest fires, developing carbon sinks by establishing industrial plantations, and research for preserving natural forests are all beneficial approaches contributing to combating desertification through R&D research. Other studies and trials, determining aridity stress level of trees for example, are conducted to determine adaptation to climate change. Many studies have been conducted by forestry research units, including important research on reclamation of forest trees and seeds, origin and offspring trials for trees that may adapt to climate change, determining species and planting distances for afforestation activities, understanding and resolving problems encountered in seedling production.

At a national level, agricultural research and development studies are conducted by the Ministry of Food, Agriculture and Livestock (GTHB), Faculties of Agriculture of various universities, by NGOs and the private sector. There are 48 research institutes working under GTHB, and within these the General Directorate of Agricultural Research and Policies (TAGEM) fulfils a very important role. Established in 1991, TAGEM is assigned to develop undertake high quality research to develop information and technologies that provide social, economic and environmental benefits from plants, animals, water products, food, forage, from the environment and natural resources of Turkey. Also important are studies conducted by the Konya Soil, Water and Combating Desertification Research Station Directorate. These include developing agronomical and culture practices to keep waters and soil moisture in place and to reduce agricultural production risks in arid and semi-arid areas. They do this by:

1) Developing suitable methods and technologies for efficient water use in agriculture;
2) Determining usage conditions for low quality waters in irrigation;
3) Ensuring preservation, development and sustainable use of water sources in watersheds;
4) Developing regional level aridity risk analyses, and early warning and suitable land use systems;

5) Determining possible changes that climate change will cause on soil and water resources and vegetative production and developing suitable adaptation methods; and
6) Developments on aridity and desertification, and making suggestions to prevent possible crises.

Projects on climate change, desertification, erosion, carbon budget, and soil and water pollution are conducted under the General Directorate of Soil Water Resources under TAGEM. GTHB launched R&D project support in 2007, and secretariat duties for this are performed by TAGEM, with projects monitored through annual group meetings. Research institutes under TAGEM also run other projects, either alone or in collaboration with universities, NGOs or private sector within scope of support provided by the Turkish Research Council (TUBITRAK).

In addition to TAGEM, universities and the Renewable Energy and Environment Technologies Cluster (OTSIM) play an important role. OSTIM members consist of private sector members, NGOs such as the Turkish Foundation for Combating Soil, for Reforestation and the Protection of Natural Habitats (TEMA Foundation), Turkey Soil Sciences Association, Bugday Association for Supporting Ecological Living, Ecological Agriculture Organization Association, and the Organic Product Producers and Industrialists Association (GUDER). They focus on R&D studies to combat aridity, agricultural waste as a renewable energy source, land degradation, land usage, and erosion, and in doing so established their own R&D units. The UN GEF Small Support Program provides funds to local groups and NGOs for these studies on preserving biodiversity, combating climate change, land degradation, and sustainable forest management.

TUBITAK also provides various kinds of research and scientific support to issues such as utilizing agricultural waste, supporting renewable energy sources, land degradation, and preventing loss of biodiversity, through a number of programs:

1) 1001- Scientific and Technological research Programs Support Program;
2) 1003 - Prioritized Areas R&D Projects Support Program;
3) 1005- National New Ideas and Products Research Support Program;
4) 1007- Public Institutions Research and Development Support Program;
5) 1301- Initiative to Establish Scientific and Technical Cooperation Networks and Platform Project (ISBAP);
6) 1501 - TUBITAK Industry R&D Projects Support Program;
7) 1511 - TUBITAK Prioritized Areas Research Technology Development and Innovation PDP;
8) 1512 - Enterprise Gradual Support Program;
9) 1513 - Technology Transfer Offices Support Program, and
10) EU FP7 and H2020 Programs; and
11) 509 - TUBITAK International Industry R&D Projects Support Program.

Scientific studies, researches, and technology development programs to increase the efficiency of combating desertification and land degradation are constantly increasing in Turkey. Studies are focused on realising effective monitoring and evaluation systems, and

large developments in this area are expected in near future. However, there are still some deficiencies in the sufficiency of research and development studies, and putting them into practise. It is important to increase the funding that institutions need, developing cooperation between institutions, and introducing incentives and mechanisms to efficiently put scientific studies into practise. Thus this Strategy and Action Plan aims to plan and support scientific and technological infrastructure, encourage coordination between different institutions to increase research output and putting technologies into practise.

2.4. Turkish National Action Program to Combat Desertification (2005) Application Results and Gained Experience

The Turkish National Action Program to Combat Desertification, introduced in 2005, is an important means of providing cooperation and effective communication between institutions, and carrying out collaboration projects on combating desertification. Since the program has been in operation, many advancements have been observed in combating desertification and land degradation, infrastructure and capacity has been strengthened, legislation was improved, various strategy and action plans were prepared, and finances provided to achieve the activity were increased. Also within this period, many integrated project models were carried out and successful results were achieved.

The program did not, however, include indicators to allow activities to be monitored, which made it difficult to fully monitor and evaluate the program activities effectively. Nonetheless the programs status as a collaboration effort between institutions on combating desertification makes it an important source of information to shape future studies, and in this section a general assessment of the 2005 Program is summarized. All assessments presented below, the lessons learned and various mechanisms correct deficiencies were taken into consideration when the action plan for 2015-2023 was prepared.

2.4.1. Main Developments during Action Program Application Period

During the application period of the program, much effort has been undertaken by relevant public institutions and NGOs to raise awareness in the public, to mould public opinion, and to educate the population on issues related to desertification and land degradation, especially after establishment of the ÇEM. A significant level of awareness has been raised on a relatively wide scale, especially in public organizations and institutions, and in metropolitan, city and town municipalities. Despite these efforts, the overall approach was not systematic and results from studies were not as expected. Despite having a goal to establish a Combating Desertification National Coordination Unit within the Action Program, for example, desired progress on legislation to implement this goal was not achieved.

The 2005 Action Program underlined the importance of national and international coordination and cooperation and significant steps have been undertaken, especially since the Afforestation General Directorate was abolished and ÇEM was established. Signing collaboration agreements with African countries and Turkic Republics under the banner of

UNCCD to combat desertification, land degradation and aridity, and working collectively to put this into practise, marked a significant step in combating desertification at the global scale.

The Action Program contributed to acceptance of the Soil Preservation and Land Usage Act, and other legislation and regulations including the National Afforestation and Erosion Control Mobilization and Afforestation Regulation and Good Agricultural Practise Regulations for example. It also supported establishment of the Water Management General Directorate in 2011. Not all legislation introduced has been successful. Articles in the Soil Preservation and Land Usage Act do not target functionality, which is an important deficiency, for example. The National Afforestation and Erosion Control Mobilization was a success, however, and efforts for afforestation, erosion control and improvement of forests have been significantly improved. A Draft Water Act was also prepared under the Action Program, and was submitted to TBMM, and is one of the most important results of the Program.

Turkey's National Capacity Evaluation Project, which aimed find common actions and possibly create synergy between three Rio Agreements, was undertaken in 2010. Turkey's capacity on this issue was determined, along with intersecting issues and potential synergy in the three agreements, yet steps to put all these into practise were not taken.

The emphasis placed on combating desertification and land degradation studies increased once Turkey became a signatory to the UN agreement on combating desertification in 1998, and accelerated further after "Turkish National Action Program to Combat Desertification" was prepared under this agreement. "Directorate General of Combating Desertification and Erosion" (ÇEM), established on 4 July 2011 under statutory decree no 645, and was the first general directorate with specific responsibility for desertification. After the establishment of this Directorate, studies for combating desertification were coordinated more efficiently at both national and international levels.

The Afforestation and Erosion Control Mobilization covering the period 2008 to 2012 targeted activity on 2.3 million ha over five years, but with extraordinary effort this target were surpassed. Afforestation, erosion control, rehabilitation of degraded forest areas and pasture reclamation works were conducted on 2.42 million hectares of land. Turkey had conducted afforestation, erosion control, rehabilitation of degraded forest areas, pasture reclamation, establishment of energy forests, artificial rejuvenation, and special afforestation works in 7.3 million ha area until the end of 2011. 6.8 million hectares of this was conducted by forest organizations, while the General Directorate of State Hydraulic Works (DSI) conducted afforestation, erosion control, and pasture reclamation works on 27 733 ha, the Vegetative Production General Directorate (BÜGEM) on 424 234 ha, and other institutions conducted erosion prevention work on 79 286 ha.

One of the innovative approaches carried out was implementation of integrated and participatory watershed rehabilitation management projects. These projects include:

1) Eastern Anatolia Watersheds Rehabilitation Project: started in 1993 and implemented in 11 provinces with various institutions' cooperation, aimed to improve villager participation and improve the economic circumstances of citizens, presenting a new approach with forestry works providing income;
2) Anatolia Watersheds Rehabilitation Project: started in 2005 and implemented in Kizilirmak and Yesilirmak rivers' water collecting basins, it includes natural sources' rehabilitation, decreasing rural poverty, and decreasing and monitoring agricultural, animal and water pollution;
3) Coruh River Watershed Rehabilitation Project: implemented in Artvin, Bayburt and Erzurum provinces in Coruh watershed, aims to provide integrated watershed rehabilitation including vegetation, water and soil sources, improving living conditions of people living in rural areas, soil preservation, rehabilitation of degraded forests, and controlling natural disasters (such as avalanche, flood and overflow control); and
4) Murat River Watershed Rehabilitation Project: implemented in Elazig, Mus, and Bingol provinces alongside the Murat River, aims to improve life standards of people living in upper watershed by preventing natural resource degradation.

Most of the work was conducted under the Action Program on Afforestation and Erosion Control Mobilization (2008-2012), where 354 235 ha of afforestation, 2 414 925 ha of rehabilitation, 467 142 ha of erosion control, and 51 617 ha of pasture reclamation was achieved between 2005 and 2012. GTBH also performed 471 539 ha of pasture reclamation works between 2000 and 2013.

The National Watershed Management Strategy (2013-2023) was prepared to serve as a guide for short and mid-term decisions and investment programs to preserve, develop, and sustainably exploit Turkey's watersheds and natural assets. It established a common path to guide activity to achieve sustainable redress of needs and demands concerning watersheds' ecological, economic, social and cultural benefits, and services. Also, the Rural Development National Strategy (2006), Rural Development National Action Plan (2010-2013), OGM Strategical Plan (2010-2014) and its updated version (2013-2017) were prepared and implemented. Wetlands Preservation Regulation was prepared in 2006 and updated in 2010. Also, Biological Diversity Strategy and National Action Plan was updated in 2007, and Climate Change National Action Plan (2011-2023) was prepared. The "National Exploitation and Management Project" was implemented to identify and classify pastures, covering 48 provinces, supported by Scientific and Technological Research Council of Turkey (TUBITAK), and the Pasture Information System Project (MERBIS) implemented by GTHB, where grasslands and pastures in 81 provinces can be monitored online.

A project to identify the criteria to establish a baseline to monitor desertification, and combat desertification, was started in collaboration with TUBITAK in 2013, and desertification indicators and criteria were set. The "National Watershed Monitoring and Evaluation System (HIDS)", through a ÇEM-TUBITAK collaboration, is expected to be complete in 2015. Finally, the Preservation of Agricultural Lands for Environmental Purposes (CATAK) implementation was conducted with World Bank financial support between 2006 and 2008, but has continued in operation using local finances since 2009.

2.4.2. Experienced Difficulties and Lessons Learned Through 2005 Action Program Implementation

One of the biggest deficiencies, similar to other sectors in Turkey, is a lack of sufficient data and an efficient monitoring system for desertification. Lack of data and analysis is the primary obstacle that would enable institutions to develop the correct policies and projects. Inter-institutional and inter-sectoral data sharing, monitoring and traceability has not been fully established. The number of research project aimed at combating desertification is limited in Turkey, as is number of experts in erosion control and desertification, insufficient in both public and private sectors. Worldwide accepted standards and common values have not been established to set a baseline to monitor and assess desertification.

Combating desertification and land degradation is a multi-disciplinary field, and establishing inter-institutional coordination is proving difficult. The Combating Desertification National Coordination Unit doesn't have a legal status as yet and this seems to be a problem in preventing inefficiency in the unit. Coordination between integrated and public participated projects on watersheds has not reached desired levels for example, except for some international projects. General Directorates under Ministries of Government sometimes wish to work independently, and as a result, the efficiency of any particular project diminishes. Activity by institutional organizations implemented at various times disrupts the continuity of services, and problems are encountered in archiving institutional documents. There are also situations where a single institute has responsibility for specific activity, such as OSIB (responsible for erosion, desertification, avalanche, flood and overflows), which occasionally results in other persons and institutions taking an insufficient level of interest on these subjects. Also natural disasters have to be endured, such as floods and landslides; where regular, sudden and heavy rains arising from a changed climate, keep posing a risk. Herd husbandry is also dominant in mountainous forest villages, and rural poverty is at high levels, which means certain forest villagers may try to hinder erosion control and afforestation efforts.

Conflicts and gaps in authority on combating desertification, forestry and other relevant legislations (e.g. pastures, mining) cause inefficiency and ineffective implementation. Society's demands regarding social and cultural services of forest are increasing due to rapid urbanization, education level and rising income levels, but legislation, plans and their application often fail to meet these new demands.

Number of parcels of land is high, and average management area is small in agriculture, and the potential for land consolidation is not completed in majority of the country. Agriculture is performed with no thought to soil conservation on sloping land, and incorrect agriculture and irrigation techniques are commonly used. Unfortunately, good technique in, for example, ploughing perpendicular to the slope, appropriate irrigation, suitable agricultural processes, informed fertilization and production techniques suitable for the natural environment are not commonly implemented.

A lack of performance criteria in the 2005 Action Plans has caused difficulties and by 2013 there was an inability to assess performance success of the actions that have been implemented. The level of consideration needed within the Action Plan, or indeed other national strategies and action plans prepared and implemented by all institutions, is insufficient. This often starts early where a named institution who will coordinate the actions, is not clearly identified within the Action Plan, and this causes problems in implementation, monitoring and assessment of the Program.

3. Combating Desertification Strategy and Action Plan

3.1. Scope and Primary Mission

The scope and primary mission of Turkey in combating desertification, identified through this Combating Desertification Strategy, are as follows:

Scope (Vision)
Turkey, through this national strategy to combat desertification, will ensure the adverse effects of aridity, desertification and land degradation are mitigated against; and will rehabilitate degraded lands whilst balancing conservation, land improvement and use, in line with sustainable environmental and natural resource management practices; ensuring rural development and improving international cooperation.

Primary Mission
Successful implementation of policies and programs aimed at mitigating the adverse effects of aridity and desertification, proactively rehabilitating degraded lands, contributing to rural development and improving local participation and international dialogue; by means of raising awareness, capacity building, technological advancement and resource allocation.

3.2. Principles

Sustainability: Ensure current and future livelihoods and development is in balance with nature, without exhausting natural resources and assets, with respect to the social, ecological, economic, cultural and spatial dimensions of development.

Participation: Stakeholder participation in decision making, implementation, utilization and responsibility.

Coordination: Ensure coordination of policies and strategies, plans, projects, implementation, monitoring and evaluation of activities between related institutions.

Efficiency: Implement projects and produce resources with best possible utilization.

Effectiveness: Fulfill objectives at the desired level.

Environmentally conscious: Attentive attitude that avoids practices that destroys the natural environment.

Transparency: Openness and sharing of processes and results of all activities with the public.

Accountability: Responsible for the consequences of all activities.

Scientific: Decision making, implementation, monitoring and evaluation based on sound scientific measures and methods.

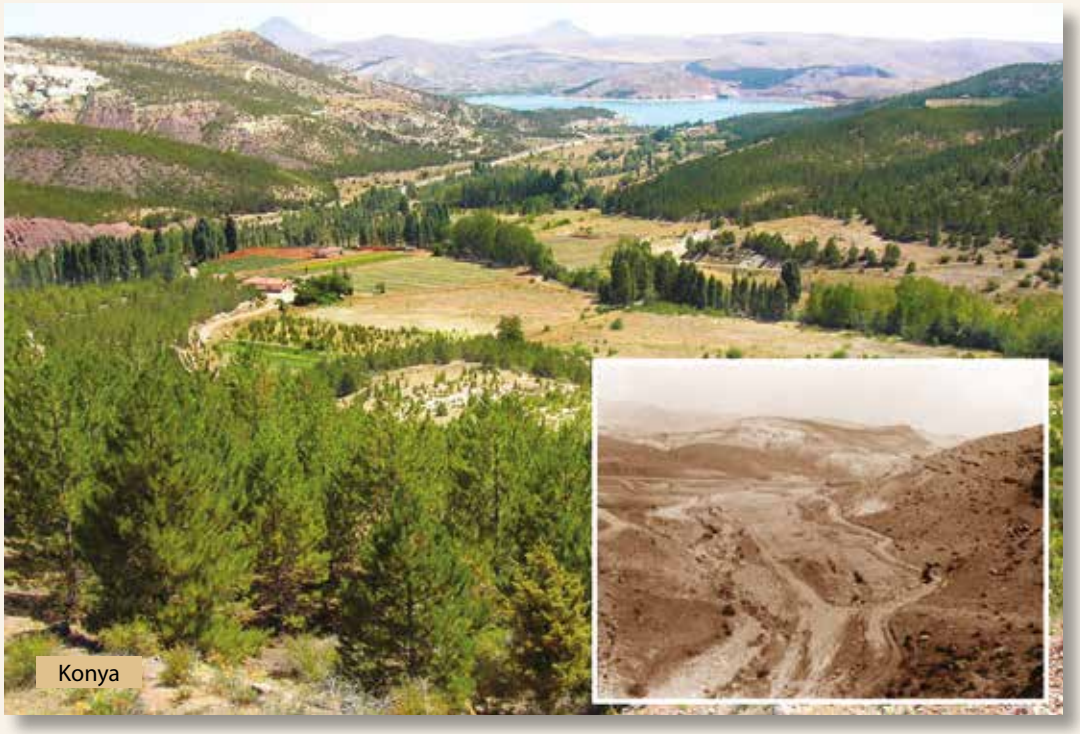
Quality: The extent to which the expectations of beneficiaries of goods and services or actions of relevant bodies is met.

Accessibility: Ensure citizens' rights of access to services and benefits.

Conformity with national development policies and other national strategy documents.

Fulfill international contractual obligations.

Fair share of costs and benefits.



3.3. Strategic Objectives, Expected Effects and Indicators

The highest level objectives set in the scope of this strategy are "strategic objectives", which extends for the whole period this strategy is in operation. The actions to be taken to fulfill these objectives and related goals are stated as “Operational objectives”, where successful implementation of operational objectives would ensure strategic objectives.

When implementing this strategy document, strategic objectives are those dealt with respect to the UNCCD 10-Year Strategy Document, but assessed as to Turkey’s specific characteristics. These, along with expected outcomes and indicators of success are provided in Table 3.1. A comparison between these national strategic objectives and those defined by the UNCCD 10-year strategy is provided in Table 3.2.

Table 3.1: Strategic objectives, Expected Outcomes and indicators for combating desertification and land degradation.

Strategic objectives	Expected Outcomes	Indicators
1. Improving affected and likely to be affected ecosystem conditions	1.1. Land productivity in affected and likely to be affected lands, and other ecosystem products and services are improved with respect to sustainability and contribution to livelihoods. 1.2. Reduced ecosystem vulnerability to climate change, aridity and extreme conditions.	*1.1. Reduction in the total area affected by desertification and aridity.* *1.2. Increase in explicit primary productivity in affected lands.*
2. Improving affected and likely to be affected population's living conditions.	2.1. Improved livelihoods of affected rural population; improved revenues, social and ecologic living conditions through sustainable land management	*2.1. Decreased number of persons adversely effected by desertification and aridity.* *2.2. Increased rate of people living above the poverty line in affected lands.* *2.3. Decreased rate of migration in local populations, from rural to urban areas.*
3. Ensure national and global benefit in conserving biological diversity and fighting climate change as well as in combating desertification.	3.1. Efforts in the field of combating desertification contribute to mitigation of the impact of climate change and conservation of biological diversity as well as contributing to its sustainability.	*3.1. Increased carbon supplies in affected lands.* *3.2. Increased area (in hectares) in forest, agricultural and aquatic ecosystems applying sustainable management practices.*
4. Mobilize necessary resources to support the implementation of the UNCCD Convention by means of establishing an efficient partnership between national and international actors; in that regard, Turkey leading the bilateral, regional and global cooperation, sharing experiences and information with other parties.	4.1. Necessary increases in financial, technical and technological resources; more efficient and effective use of resources for the domestic implementation of the UNCCD Convention in combating desertification in Turkey. 4.2. Necessary setting of political framework, cooperation and practices to ensure efficient contribution and participation of all related parties for the implementation of UNCCD Convention on Combating Desertification. 4.3. Level of information, awareness and solidarity of different segments of society and economic groups on the mitigation of the impact of aridity and in combating desertification is increased. 4.4. Turkey's effectiveness and prestige increased in international institutions and decision making mechanisms. 4.5. Institutions to contribute to combating desertification on bilateral and/or regional level are established; efficiency of cooperation, projects and programs by Turkey in other regions and countries have been improved.	*4.1. Increased number of national experts actively working in international Institutions and decision making bodies.* *4.2. Increased number of medium and large scale bilateral/regional/global technical cooperation projects, capacity building and implementation in coordination with Turkey* *4.3. Increased quality and quantity of existing data necessary to mitigate the impact of desertification and aridity.* *4.4. Increased variety and level of existing financial support and facilities to mitigate the impact of desertification and aridity.* *4.5. Ensure development policies and measures involve mitigation of the impact of desertification and aridity; and increased solution offers.*

Table 3.2: Comparison of Strategic objectives in UNCCD 10 Year Strategy Document and Turkey's Combating Desertification National Strategy

United Nations Convention on Combating Desertification, 10 Year Strategy Document	Turkish National Strategy
1. Improving affected population's living conditions.	1 Improve living conditions of affected and likely to be affected populations.
2 Improving affected ecosystem's conditions.	2 Improve conditions of affected and likely to be affected ecosystem's
3 Ensure global benefit through effective implementation of the agreement.	3 Ensure national and global benefit in conserving biological diversity and fighting climate change as well as in combating desertification.
4 Mobilize resources by ensuring efficient partnership among actors for successful implementation of the agreement.	4 Mobilize necessary resources to support the implementation of the convention by means of establishing efficient partnerships between national and international actors; and in that regard, Turkey leading the bilateral, regional and global cooperation, sharing experiences and information with other parties.

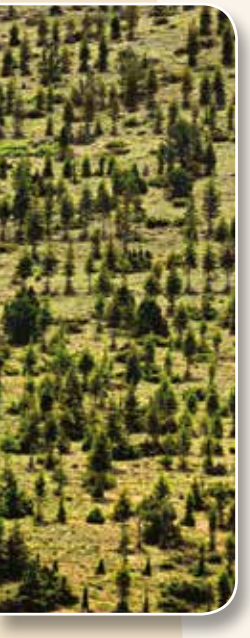
3.4. Operational Objectives and Outputs

The "Operational objectives" necessary to realize the Strategic objectives defined in section 3.3 are presented in Table 3.3. A comparison between the operational objectives identified in the scope of the national strategy and the UNCCD 10-Year Strategy Document is presented in Table 3.4.

Table 3.3: Operational objectives and Outputs

Operational objectives	Outputs
1. Molding Public Opinion, Awareness Raising and Training Extend studies in combating desertification and land degradation as well as increasing support and contribution through influencing processes and actors.	1.1. More frequent national media coverage on combating desertification and land degradation, and significant increase in number of groups reached. 1.2. Consumption and usage habits of related populations are reviewed, strategies identified and put in action, and training deliveries are done in order to reduce natural resource use habits that leads to desertification and land degradation. 1.3. All stakeholders efficiently involved in combating desertification and land degradation processes, and acting to defend against desertification. 1.4. Combating desertification and land degradation and mitigation of aridity included in higher education, formal and informal education programs.

Operational objectives	Outputs
2. National and International Coordination and Cooperation Ensure efficient communication, coordination and cooperation between related national and international organizations and institutions; through international organizations, NGOs and TİKA ensure efficient cooperation and collaboration with countries mitigating desertification and land degradation, starting from Africa, Middle East and underdeveloped countries.	2.1. National legislation to coordinate international agreements prepared; efficient communication between existing national legislations and institutions ensured. 2.2. Partnership and cooperation agreements to combat desertification and land degradation signed with other countries and international organizations; national and international cooperation projects are planned and implemented with high level participation, cooperation and coordination.
3. Political Framework Prepare the necessary political and legal setting to support combating desertification and land degradation.	3.1. Methods, tools and financial resources to integrate combating desertification and land degradation strategy and action plan to national action plans and programs, national and regional development plans, spatial plans and sectoral investment decisions and programs are identified and mobilized. 3.2. Legal, financial and socio-economic challenges as well as overlapping and duplication in different laws and legislation about combating desertification and land degradation are identified and necessary legislative amendments are made; also legislation is harmonized in the framework of combating desertification and aridity.
4. Science and Technology, Monitoring and Evaluation Produce and share information and data by means of research, technology development, monitoring and evaluation activities on combating desertification and land degradation and mitigate impact of aridity at international, national and regional levels.	4.1. A national Monitoring and Evaluation System, based on qualified data and in line with country specifications is developed. 4.2. Data and information about the interaction between desertification, aridity and climate change in affected areas are produces with respect to scientific and traditional information. 4.3. Risk analysis and management activities implemented at the national level. 4.4. Common and integrated R&D and technological advancement projects and activities are conducted, coordinated, publicized and implemented.



Operational objectives	Outputs
5. Administrative Structure and Institutional Capacity Building Identify necessary capacity building requirements to improve efficiency of public and non-public institutions, and implement the plan to fulfill those requirements.	5.1. Capacity assessment of the current situation in Turkey in combating desertification and land degradation is complete, and respective action plans are put in to action. 5.2. Qualified human resources raised in combating desertification and land degradation. 5.3. Improved contribution and participation of NGOs such as unions, foundations and cooperatives as well as the private sector in combating desertification and land degradation processes and activities.
6. Finance Increase funds and efficiency and effectiveness of using these funds in combating desertification and land degradation; improve financial cooperation in technology transfer at the international level.	6.1. Financial incentives (loans, grants) and technical assistance mechanisms are built and necessary fund raising ensured to prevent desertification and land degradation, mitigate aridity, rehabilitate effected lands and ensure relevant population development; to develop technology, and to implement and share best practices. 6.2. Necessary steps to allocate international funds for combating desertification and land degradation are identified, investment schemes and plans are developed to transfer funds to effected populations and ecosystems.
7. Sustainable land management Identify integrated preservation measures and rehabilitation practices focused on climate change to preserve biological diversity and ecosystem services towards affected and likely to be affected zones and ecosystems; implement them through sustainable management mechanisms.	7.1. Ecosystems, trends and lands affected by desertification and land degradation, and/or that are at risk and sensitive, are mapped and priority subjects are identified. (Note: Actions stated under 4.1. also contribute to this output). 7.2. Land use codes in areas affected from desertification and land degradation as well as potential desertification lands are identified, legal measures are taken to prevent inability of use. 7.3. Special approaches for affected zones are developed to decrease soil loss and erosion sensitivity of land (e.g. suitable cultivation and rehabilitation, irrigation, fight against soil and water contamination, organic farming and good farming practices, afforestation, techniques of rehabilitation of spoiled forest, methods and soil preservation strategies); and respective adjustments are made and implemented in plans and projects accordingly. 7.4. Amelioration practices in forest, steppe, pasture, wetland, coastal zone and other natural habitats in line with natural ecosystem structure. 7.5. Contributed to decreased emission through climate friendly agricultural practices and approaches to increase carbon sink capacity of habitats. 7.6. Preservation of ecosystem services and biological diversity approach integrated and practiced in management plans.

Table 3.4: Comparison of the Operational objectives between the UNCCD 10-Year Strategy Document and the Combating Desertification National Strategy.

UNCCD 10 Year Strategy Document	National Strategy
1. Advocacy, awareness raising, training	1. Molding public opinion, Public awareness raising and Training
2. Political framework	2. National and International Coordination and Cooperation
3. Science and Technology	3. Political Framework
4. Capacity building	4. Science and Technology, Monitoring and Evaluation
5. Finance and technology	5. Administrative Structure and Institutional Capacity Building
	6. Funding
	7. Sustainable land management

3.5. Actions and Indicators

Actions and their associated indicators of success are presented in Annex 3. Next to each performance indicator, the expected implementation period, responsible institutions and cooperating institutions are indicated separately. In Annex 3 all actions stated in the plan are aligned with the outputs under each operational objective.

The time schedules for actions and indicators of success are prepared with respect to the projected completion date being 2018, by which action indicators are planned to be completed. However, certain activities relating to the primary indicators are to be implemented over a longer period (i.e. will not be completed by 2018), and thus for these activities the completion dates for some indicators of the same type are extended, with attention not to exceed the deadline for full implementation of the strategy, which is 2023.

4. Coordination, Monitoring and Assessment of Combating Desertification Strategy and Action Plan

4.1. Coordination, Monitoring, Assessment and Reporting of Desertification and Combating Desertification Strategy and Action Plan

Desertification, land degradation and aridity are events experienced on a global scale which adversely affect the natural environment, the flora and fauna living in such environments, and human communities. It is very important to acquire information on the current status of desertification and land degradation, and gain an understanding of why it occurs, in order to reverse the adverse effects experienced and to extend the positive results obtained from efforts to apply best practices. It is therefore critical to monitor the efforts made, to assess the impacts they create and change future practices accordingly.

Monitoring is a continuous process, in which the processes, outputs, impacts and responses to activity that has been carried out are observed and measured, so that results can be evaluated and interpreted through an assessment process, which can include the use of statistical and interpretational analysis of data. In order to undertake a successful monitoring programme it is important to:

1) Have accurate and reliable information on the current status;
2) Have indicators that represent the observed change;
3) Not select indicators that are hard to monitor, expensive and risky;
4) Conduct monitoring using same time intervals, in same locations and using the same methods where possible;
5) Determine what should be monitored in regard to specific actions, and to regularly record the monitoring activity and check its accuracy as necessary.

In this section required monitoring and assessment of desertification, and that related to the implementation of the Strategy and Action Plan are addressed.

4.1.1. Monitoring of Desertification

Turkey is a country that is likely to face desertification risk when issues such as its climate, topography, geology, hydrology, vegetation cover, presence of arable and non-arable land, characteristics of pasture and forest areas and the impact of population are taken into consideration. In the Global Desertification Vulnerability Map (Figure 4.1: Global desertification vulnerability map (NRCS, 2015).Figure 4.1), a significant portion of Turkey is displayed as vulnerable to desertification.

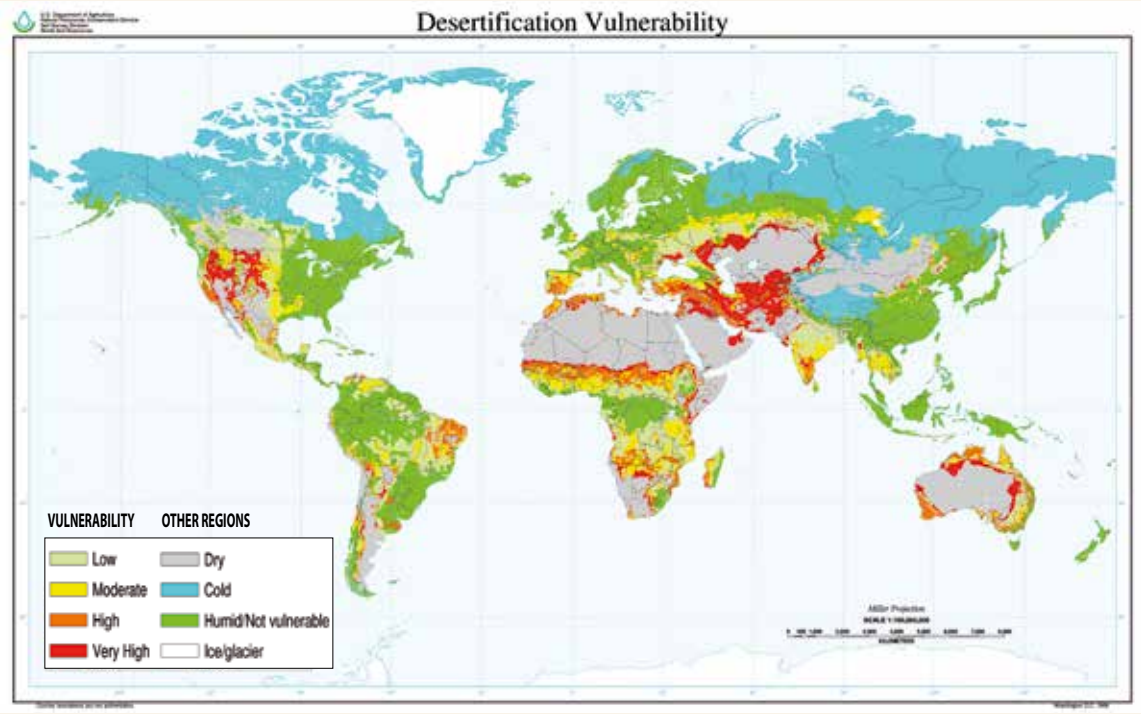


Figure 4.1: Global desertification vulnerability map (NRCS, 2015).

There are many different causes of desertification and thus efforts to combat desertification must be undertaken by many different institutions and organizations. The monitoring efforts required are also multi-dimensional in regard to both locations applied and use, and there should be an active coordination system in place between institutions so that an effective monitoring-assessment system can be implemented and operated. An integrated desertification monitoring system has been launched and started to be implemented in Turkey in recent years, but until now an active coordination system has not been fully established in Turkey, although many institutions operate their own monitoring-assessment systems (Annex 5).

While some of these systems are directly related to desertification, others are only indirectly related. The monitoring and assessment system established under the scope of the "Development of Basin Monitoring and Assessment System Project", realized by ÇEM with preparation efforts carried out by TUBITAK-BILGEM, is the most effective and comprehensive tool developed for the monitoring of desertification in Turkey. The Basin Monitoring and Assessment System was developed based on geography, with the objective to reduce monitoring related costs, take necessary precautions by carrying out fast and up-to-date monitoring, making successful investments based on results of the monitoring of projects undertaken at the basin level, and the balanced use and protection of natural resources. The project resulted in establishment of a monitoring system infrastructure, through which data themes to ensure sustainable basin management, was determined in coordination with institutions operating on basins. Within the scope of the project a Turkey

Desertification Model and Risk Map was prepared, and training carried out on the HİDS Model Verification and Calibration Efforts and Geographical Information Systems.

In order for the system to be operated effectively, country specific criteria and indicators for monitoring of desertification and determination of areas vulnerable to desertification were first determined, presented in Table 4.1. It is intended to establish a desertification model that is suitable for Turkey, in line with the desertification criteria and indicators and to finalize the initial model at the end of 2014 and to develop this model further in subsequent years. In addition, an Erosion Monitoring System was established for monitoring of activities carried out on erosion issues within the scope of the project and creation of a data archive. Erosion maps as per basin were prepared as part of this process.

Table 4.1: Desertification Criteria and Indicators in Turkey

Category name (Criteria)	Number of Variables / Parameters / Indexes / Indicators
1. Climate	11
2. Land	11
3. Vegetation cover and land use	3
4. Topography and geomorphology	5
5. Water	3
6. Socio-economy	9
7. Management	11
Total	**53**

As part of the monitoring of desertification in Turkey, an Aridity Index was developed, based on the desertification vulnerability map, which identifies areas of Turkey that are prone to desertification. Desertification Vulnerability Severity Classes for areas of Turkey which are open or sensitive to desertification or that have climatological desertification potential were determined and mapped; taking account of climate, climatic variation and drought characteristics and conditions. As a result of the study a risk map was produced (Figure 4.2) which identifies those areas that are vulnerable to desertification (i.e. desertification sensitive) based on the developed severity classes.

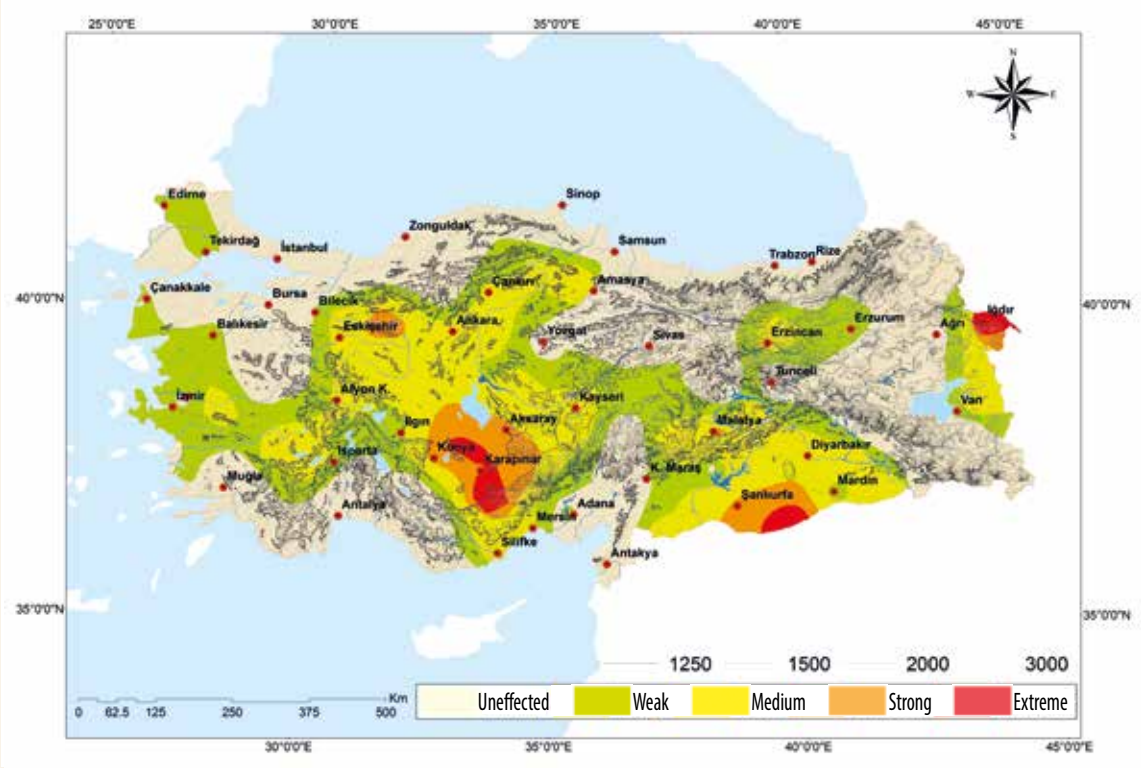


Figure 4.2: Turkey desertification risk map prepared by using climate data

4.1.2. Monitoring of Strategy and Action Plan, National and International Reporting

Efforts undertaken nationally to combat desertification in Turkey are monitored by the General Directorate of Combating Desertification and Erosion (ÇEM) using an effective monitoring and assessment system. The basis for this monitoring is defined in the National Action Plan for Combating Desertification implemented in 2005, along with institutional responsibilities and liabilities to achieve the required aims. Information is requested annually by ÇEM, from institutions such as the Turkish Statistical Institute, Ministry of Development, Ministry of Finance, Turkish Cooperation and Coordination Agency (TIKA), Disaster and Emergency Management Department (AFAD), Ministry of Foreign Affairs. Once this information has been interpreted and assessed in line with specified prioritized actions ÇEM produce various assessment reports which are then submitted to the relevant authorities.

The main monitoring assessment and reporting systems applied in Turkey are presented in this section.

4.1.2.1. Monitoring of Strategy – Action Plan and Annual Assessment Reports

In the previous period ÇEM has prioritized monitoring of the National Action Program and now is prioritizing monitoring of the implementation success of this National Strategy and Action Plan for Combating Desertification and Land Degradation. Assessment reports

received from institutions are analyzed and assessed by ÇEM and various reports produced for different purposes. The "Annual Assessment Report" is the primary report and is a summary of all sub-reports, and details the stage reached by the different institutions in relation to the efforts carried out within the scope of action plan. It also emphasizes the work areas that need to be focused on, in the following years, by identifying activities that have yet to be started, reasons for this, and to some extent determines future priorities in combating desertification. In this context the Annual Assessment Report is considered to be a significant tool for monitoring efforts to combat desertification.

In order to perform effective monitoring, the existence, quality and tangibility of measurable indicators provided by the institutions, in relation to the actions and concordance between actions and indicators, are important factors in an effective process. As a result of the conclusions received from assessment of the 2005 National Action Program, attention was paid to determine action indicators which would activate monitoring while the National Strategy and Action Plan was being prepared. Care was also taken for harmonization of indicators required within the PRAIS reporting system, to the UNCCD Secretariat and National Strategy and Action Plan indicators. The Monitoring, Assessment and Reporting System (IDR), details of which are provided below, was prepared taking such criteria into account.

4.1.2.2. PRAIS Reporting (Performance Review and Assessment of Implementation System)

According to the UNCCD in order to determine the current condition and likelihood of desertification, land degradation and drought, it is important to determine prioritized actions on a national and global scale and to effectively monitor and assess such actions. The UNCCD convention text points out that desertification and land degradation is the result of the complex interaction between physical, political, social, cultural and economic factors. Therefore monitoring of desertification and land degradation should actively address these complex human-environment interactions.

Article 7 of the UNCCD specifies the requirements for national action plans. The original convention did not include monitoring, assessment and reporting issues, which was considered a deficiency, later remedied through Conference of Parties (COP) resolutions. The lack of monitoring-assessment in the convention was remedied in 10-Year Strategy Document and a specific section under the title "Performance Monitoring" was added. Accordingly, indicators for both strategic and operational objectives were specified and it is these indicators that comprise the basis of the PRAIS (Performance Review and Assessment of Implementation System) reporting system (See Annex 6 for details of the indicators). Signatory countries are required to complete reports that are compatible with the PRAIS system, and are logged directly using the internet. PRAIS is a system established to facilitate the reporting process for the period 2008 to 2018. Signatory States, NGOs and other

reporting organizations provide data input to the system using various templates. Turkey reports biannually (Table 4.2) via this system, as both an "affected" and "developed country".

Table 4.2: PRAIS reporting periods

Period reported	Reporting year
Reporting Period 2008-2009	2010
Reporting Period 2010-2011	2012
Reporting Period 2012-2013	2014
Reporting Period 2014-2015	2016
Reporting Period 2016-2017	2018

In these reports, the PRAIS system is used to monitor process and implementation, within the context of combating desertification, and is not used to identify specific changes that have occurred to the land (i.e. it is not used to monitor changes in area that underwent afforestation, for example). Within the scope of the UNCCD monitoring-assessment reports, the PRAIS system is primarily focused on two area: 1) whether the data obtained from the actions attain the combat desertification target; and 2) the numeric value of the reported data. It is not focused on what activity is done where, or which method was used, but instead monitors the outcomes of activity in relation to measures such as the population reached, to what extent they were affected or their awareness was raised, finances and effort spent.

The required information was much more comprehensive when the PRAIS system was first established. Signatory countries were not able to prepare the reports required so a revision was made on the format and content, and requested information was reduced by 60 to 70%. Also it was decided that reporting of information within the scope of strategic objectives would be completed once in every four years.

4.1.2.3. Internet Based Monitoring, Assessment and Reporting System (IDR)

The General Directorate of Combating Desertification and Erosion has developed and launched an Internet-based Monitoring, Assessment and Reporting System (IDR). It is used for the effective collection and reporting of information obtained from all institutions. Figure 4.3 shows which Ministries (including Directorates) and other institutions that have specific reporting responsibilities. The system is used as a basis for preparation of both PRAIS reporting requirements, but also other national reports, with output reports available to a large national and international stakeholders (Figure 4.4).

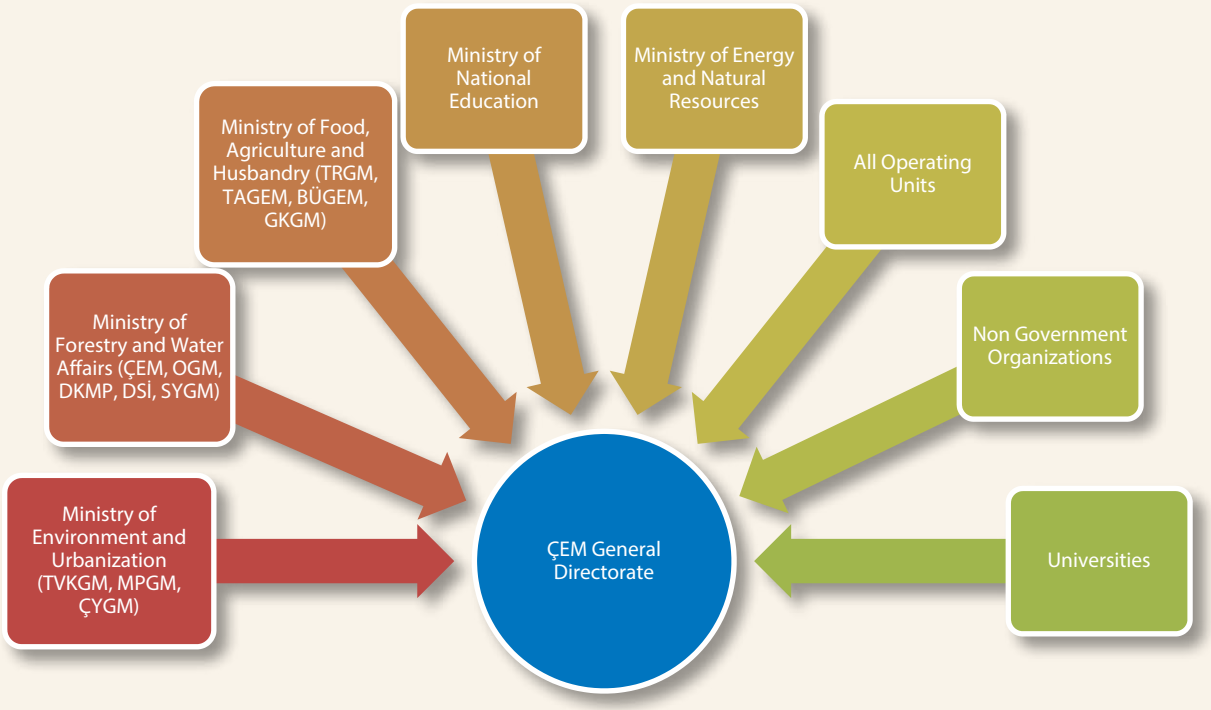


Figure 4.3: Institutions to provide data to Monitoring, Assessment and Reporting System

Figure 4.4: Institutions to benefit from Monitoring, Assessment and Reporting System

IDR was launched within the scope of the Combating Desertification National Action Plan Harmonization Project, designed and implemented in 2014 by the ÇEM and FAO Central Asia Office. The objective of the developed software was to review and analyze the existing information sources (e.g. Annex 7) and information management mechanisms, and to create a design proposal accordingly. The development will propose an integrated and functional monitoring, assessment and reporting system. When IDR was being prepared the UNCCD data requests, criteria and indicators and reporting principles were taken as a basis for the development, whilst accounting for conditions in Turkey . At the beginning of the process, UNCCD criteria and indicators were addressed in terms of which information is requested and the manner in which it is to be reported. The activities in the Combating Desertification National Strategy and Action Plan were scrutinized and the primarily analysis phase was carried out through interviews with the coordinator and the responsible stakeholder institutions of specific Actions. In the subsequent phases the data base design was made and the application developed on this basis.

4.2. Institutional Regulations, Responsibilities, Financing and Coordination

4.2.1. Synergy and Cooperation with Other Rio Conventions (Protection of Biodiversity and Combating Climate Change)

The requirements of the UN Convention of Combating Desertification (UNCCD) overlap and have significant connections with two other Rio Conventions, the UN Convention on Biodiversity (UNCBD) and Framework Convention on Climate Change (UNFCCC). Ensuring harmony and coordination between these three conventions is deemed to be a new and creative approach for the development and implementation of Turkey's National Strategy and Action Plans. The UNCCD is the main subject of this document, but in this section implementation of the two other Rio Conventions are introduced, along with the approach on how to ensure coordination in the implementation of Combating Desertification National Strategy and Action Plan.

Turkey signed the Convention on Biodiversity in 1992 and approved it in Law No 4177 in August 1996. The General Directorate of Preservation of Nature and National Parks, which is affiliated to the Ministry of Forestry and Water Affairs, is the Turkish focal point for this Convention. The Turkish National Biodiversity Strategy and Action Plan, which was updated in 2007 with UNEP and Global Environment Fund (GEF) grant support, contains the vision, principles, objectives and political targets for the protection of biodiversity.

As of May 2004, Turkey became a party to the United Nations Framework Convention on Climate Change (UNFCCC), as the 189th signatory country. The Ministry of Environment and Urbanization acts as the Turkish focal point to the Convention and in 2001 the Climate Change Coordination Board was established to coordinate combating climate change efforts according to the obligations of the UNFCCC. Turkey's National Climate Change Strategy Document, covers activity from 2010 to 2020 contains reduction, concordance, finance and technology policies to be adopted by Turkey, to the extent permitted by its national facilities

and accessibility to international finance and grants. The National Action Plan on Climate Change (2011-2023), published in 2011, contains sectoral sub-actions under control of greenhouse gas emissions and concordance to other climate change goals.

Action, towards creating synergy between the Rio Conventions within the scope of the Assessment of National Capacity in Turkey Project, continues. Accordingly, the overlapping nature of these three conventions is integrated in sustainable management and integrated efforts should be made in this context. It is necessary to have a coordinated mechanism between the three conventions, establishing a Data Centre and network for ensuring cooperation and staff training given to maintain and develop the network. There is a need to create a national database for data storage and management, covering the three conventions, to determine data collection needs and reporting standards, all towards the common effort for all conventions. The Data Centre and network will develop needed personnel, identify equipment and other needs; and will train the staff of other relevant institutions, provide advice and guidance to institutions that collect and report data in thematic fields, develop data verification mechanisms and establish the information network for reporting.

Efforts towards effective implementation of the Conventions require R&D support, but to facilitate common use adaptation of existing research infrastructure facilities and development of financing mechanisms for such facilities are also needed. There is currently no institutionalized training, publications or awareness of the Rio Conventions and a high level board is required, through which capacity building and training efforts can be carried out.

Participation of the private sector in the implementation of the Conventions in Turkey is not yet at desired levels. Accordingly, there is a need to make the necessary legal regulations, to carry out training and awareness raising efforts, to increase cooperation, to promote social responsibility projects, and to determine social and economic tools in order to direct the private sector and to integrate the requirements arising from the obligations of the Rio Conventions into an operational field that the private sector can also take forwards.

In Turkey NGOs generally have separate activities they carry out regarding each Rio Convention, but NGO action towards creating synergy between the three conventions are inadequate. A seminar was organized by REC Turkey in 2008 on taking steps for increasing the synergy and interaction between the Conventions on Biodiversity and Combating Desertification and Climate. The seminar, within the framework of admission to EU process, transferred sustainable development strategies and approaches to Turkish environment stakeholders. In the seminar decisions were taken which included establishment of a joint task force for work programs by NGOs and relevant public bodies, joint operation of scientific bodies, popularizing national action programs, on emission processes resulting in deforestation, launch of R&D efforts towards common processes like land degradation by reduced soil cultivation and reducing emissions, for example; and by increasing cooperation at a national level.

To achieve harmonization of national action plans for the three Rio conventions, joint actions on biodiversity and land degradation were included in the Climate Change Action Plan in 2011; whereas provision for such synergy was not included in the Biodiversity Action Plan developed in 2007, for example. The Turkish Combating Desertification National Strategy and Action Plan summarizes the activities that are planned between 2015 and 2023, within the framework of combating both desertification and land degradation. It aims to establish a basis for the performance of works planned by different institutions, carried out effectively and through cooperation. During preparation of the Combating Desertification Strategy and Action Plan 5th Climate Change National Communication, the Biodiversity and Climate Change National Strategy and Action Plan were also elaborated and within these actions directly related to land degradation were adapted in to the Combating Desertification Action Plan. In addition, in 2011 and to ensure coordination and cooperation between Rio conventions on a national scale, the National Capacity Action Plan of Turkey was prepared by the now defunct Ministry of Environment and Forestry. Also during the preparation stage of the action plan, the opinion of experts from the Climate Change Department (affiliated to General Directorate of Environmental Management) and specialists from the Biodiversity Department (affiliated to General Directorate of Nature Protection and National Parks) were received. The importance of establishing synergy between the three Rio Conventions was also explained in detail to stakeholders in all thematic group workshops during the preparation of this Strategy and Action Plan, and they were asked to take synergy issue into consideration while making their suggestions for the plan.

In this Strategy and Action Plan, three out of seven strategic objectives in directly cover the Rio Conventions. Within the strategic objectives for example, reducing emissions using climate friendly agricultural practices and approaches that would increase the carbon sink capacity of natural areas, integrating protection of biodiversity and ecosystem services into land management plans, preparing a national legislation that ensures coordination with international conventions, and Rio Convention in particular, providing active inter-institutional communication on existing national legislations, and the outcomes to attain such objectives as well as actions and indicators pertaining thereto, are included in the action plan.

The three Rio Conventions are managed by different Government Departments; the Biodiversity Convention and Combating Desertification Convention are coordinated by the Ministry of Forestry and Water Affairs, and the Climate Change Convention is coordinated by the Ministry of Environment and Urbanization. In the 10th Development Plan for Turkey the necessity for improvement in planning, implementation, monitoring and control processes in environmental and natural resources management, is clearly identified. Steps that would create coordination between actions of the three Rio conventions and the stakeholder, however, were left out. Thus, in Turkey, there is not yet a structure to fully coordinate the efforts undertaken on a national scale within the scope of the three Rio Conventions. Turkey's recently completed the Assessment of National Capacity of Turkey Project in which joint actions that would create synergy between the three Rio conventions were identified, but despite this the required steps for implementation of project outcomes could not be taken.

In order to achieve what is necessary to ensure synergy, connection and coordination between the three Conventions, Turkey needs to establish a Program Coordination Unit.

4.2.2. Coordination of Plan Implementations

In order for the Combating Desertification National Strategy and Action Plan to succeed, it is crucial there is coordination in planned and performed activities by the different institutions involved. In this section the coordination, cooperation and communication tools applied for effective implementation of the Strategy and Action Plan are elaborated.

The Combating Desertification National Coordination Unit (UKB) serves both to coordinate the action plan and to ensure effective cooperation between institutions. Once a year the UKB convenes to discuss developments in the Strategy and Action Plan and makes recommendations on matters that need to be addressed in the following year. UKB is a high level coordination and direction platform consisting of academics and experts from responsible institutions and organizations. The unit monitors and assesses the processes undertaken, evaluates the effort and developments of the national strategy and action plan, sets corrective measures to eliminate significant bottlenecks and provides recommendations and assistance required by the UNCCD Secretariat to conduct its works efficiently and effectively.

Another important coordination unit is the Combating Desertification Action Plan Technical Committee, which comprises representatives of responsible institutions working under the action plan. The Committee convenes twice per year to assess the progress made and problems encountered in the implementation of the Action Plan. Each representative informs the Committee about the progress made by their institution, and following a general assessment, decisions are made on matters to be focused on in the next period. The National focal points of the Rio Conventions are also present in these meetings. One of the main functions of the Technical Committee is to maintain communication between institutions, to coordinate information exchange, provide implementation details and to foster collaborations. The decisions taken in the Technical Committee meeting and an assessment report are submitted to the UKB, and UKB use this as the basis for the agenda for their annual meeting.

As stated in the previous section, establishment of a Program Coordination Unit is needed, which works to ensure synergy, connection and coordination between the three Conventions.

4.2.3. Financing of Action Plan Implementations

One of the most important requirement in combating desertification and land degradation is doubtlessly the creation and release of financing. Therefore the UNCCD prioritizes financing through different mechanisms, in order that countries can establish an effective financial structure.

Turkey has a strong infrastructure and various mechanisms for financing activities to combat desertification and land degradation, usually handled by public institutions. Many institutions, but particularly the Ministry of Forestry and Water Affairs (OSIB) and Ministry of Food, Agriculture and Husbandry (GTHB) have effective financing mechanisms. The budgets allocated by public institutions for combating desertification and land degradation increase each year and the continuity of such financing is highly important, which is why it is a priority. In addition to creating the financing, its effective use and transfer to the right actions and technical priorities is as important. Turkey provides financial aid for its own national efforts in combating desertification and land degradation but also provide funds regionally and globally, under the scope of bilateral agreements and capacity building efforts.

Resources allocated to some of the work areas on desertification and land degradation should be increased at a faster rate in future, particularly towards R&D efforts, which are ranked first among priority areas. There are many research institutions operating within universities and public institutions and it is essential that these institutions get the support they need to increase the work they are conducting and make their work more effective. It is foreseen that climate change will have a large effect on production lands and ecosystems in Turkey, with increased impact from desertification, land degradation and drought in the future. Research in this field needs to be increased, along with harmonization, and should be brought to the desired level as soon as possible.

GTHB, which is responsible for the management of agricultural lands and pastures, must work in direct contact with farmers and to change its existing actions with more suitable approaches to succeed in combating desertification and land degradation. GTHB has many incentive and support mechanisms in place, aimed towards farmers and farming communities to achieve this objective. The Ministry is providing support in line with climate friendly sustainable land management principles that protect the soil and biodiversity, that prevent erosion under CATAK, and good agricultural practices and machinery aids. Nonetheless such support is not at an adequate level to attain sustainable land management objectives in agricultural land and pastures in the short term. Increasing the existing support mechanisms is key for the Ministry to realize sustainable land management.

Even though Turkey has its own financial resources, it still requires alternative funding and support, especially to implement different approaches using information and technologies that is not available at the local level. The Global Environment Fund (GEF) is an important source of funding and provides environment focused aid on issues that countries find difficult to fulfill using their own resources. Using GEF funding Turkey has developed the Sustainable Land Management and Climate Friendly Agriculture Project, which is being implemented in Konya Basin. The project is run through the joint efforts of OSIB and GTHB. The project is an attempt to implement an action plan on a local scale that will develop appropriate local mechanisms to combat desertification and land degradation, which can then be used to inform others and popularize good practice examples obtained in such projects.

Payment for ecosystem services, an approach implemented in many developed countries, is beginning to be used in Turkey, but it remains important to take a step by step approach for full implementation. The approach, in which aid directed towards protection of ecosystem services on an ecological basis is provided to land owners like farmers and private sector land management groups, are predicted to be even more widespread in the future.

NGOs are conducting effective activity and providing innovative solutions on issues that respective local organizations focus on. It is important for overall progress to support NGOs, to enable these innovative solutions and traditional approaches to make a more effective input to combating desertification and land degradation, at a relatively low financial cost. Adopting a support mechanism towards NGOs is proposed in the Action Plan. The NGO and other institutions embracing this approach will act as an incentive for more NGOs to be included in the process.

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Annexes

Annex 1: Action Plan preparation process, thematic working group meeting participation list

Annex 2: Adaptation of National strategy and action plan to combat desertification, Turkey to UNCCD 10 Year Strategy Document and Reporting Process Project and Project Management Unit

Annex 3: Table of Actions in National Strategy and Action Plan to Combat Desertification

Annex 4: Strategy and action plans in operation closely related to desertification/land degradation in Turkey

Annex 5: Monitoring and evaluation systems for desertification in Turkey

Annex 6: Required Indicators in the PRAIS reporting system.

Annex 7: Usability of the data sources to be collected and things to be done.

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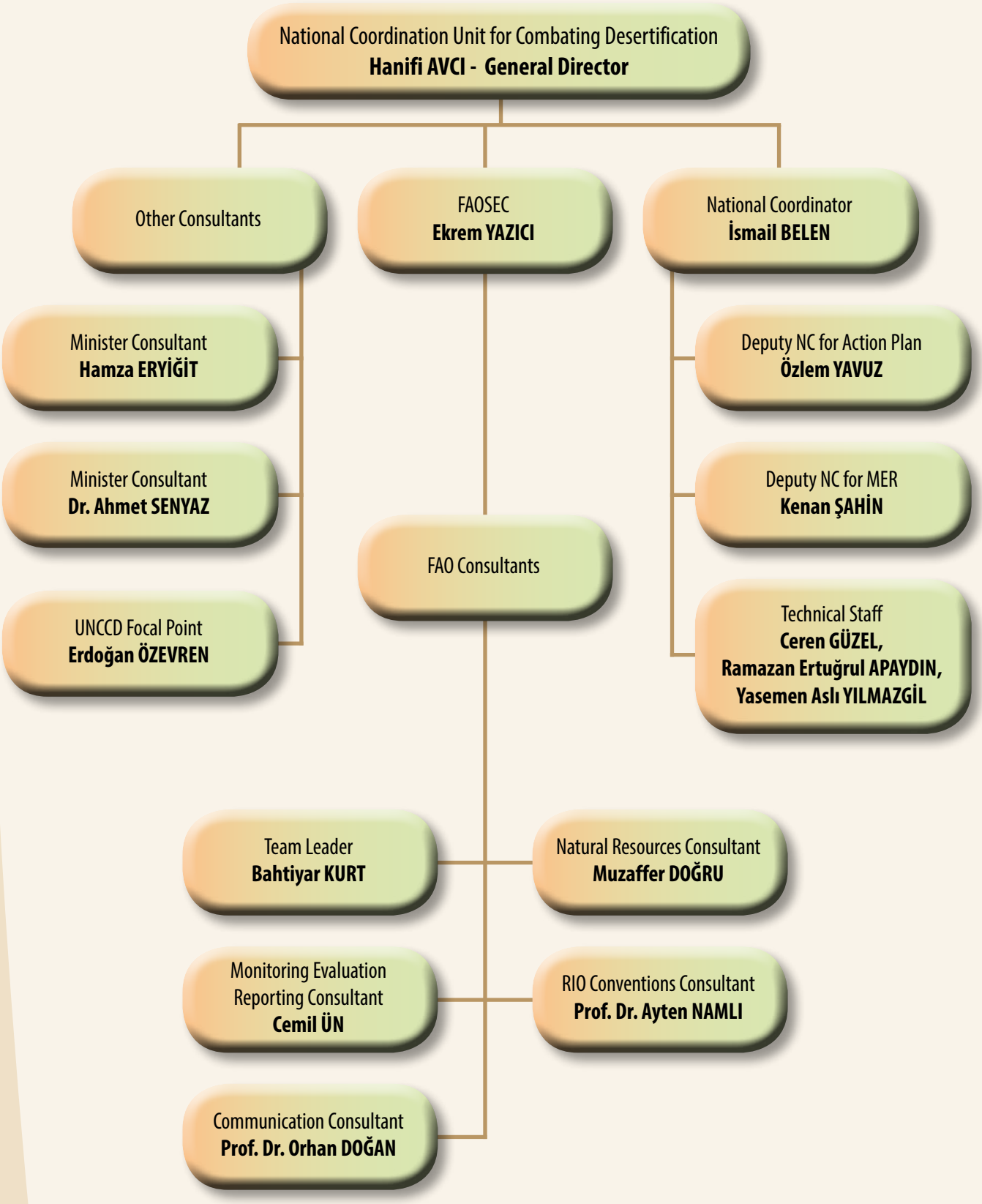
Annex 2: Adaptation of National strategy and action plan to combat desertification, Turkey to UNCCD 10 Year Strategy Document and Reporting Process Project and Project Management Unit



Annex 3: Table of Actions in National Strategy and Action Plan to Combat Desertification

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
1. Molding Public Opinion, Awareness Raising and Training Extend studies in combating desertification and land degradation as well as increasing support and contribution through influencing processes and actors.	1.1. More frequent national media coverage on combating desertification/land degradation, and significant increase in groups reached.	1.1.1. Public awareness activities about sustainable use of agricultural lands, pastures, forests and water resources as well as desertification/land degradation.	Envisaged national TV broadcast	Number	10	2015-2018	OSİB (ÇEM), GTHB	OSİB (OGM), ÇŞB, NGOs
			Envisaged radio broadcast	Number	20	2015-2018	OSİB (ÇEM)	OGM, ÇŞB, NGOs
			Media and social media coverage	Number	10	2015-2018	OSİB (ÇEM), GTHB	OSİB (OGM), ÇŞB, NGOs
			Produced posters/banners	Number	100	2015-2018	OSİB (ÇEM), GTHB	OSİB (OGM), ÇŞB, NGOs
			Number of preaching on the subject in mosques	Number	5	2015-2018	DİB	OSİB (ÇEM), GTHB
			Public spot film	Number	5	2015-2018	OSİB (ÇEM), GTHB	OSİB (OGM), ÇŞB, NGOs
	1.2. Consumption/usage habits of related populations are reviewed, strategies identified and put in action, and training deliveries are done in order to reduce natural resource use habits that leads to desertification/land degradation.	1.2.1. Identify natural resource use that leads to desertification/land degradation; report the relation and socioeconomic status of exploiter communities with these natural resources; assess the impact of desertification on economy; reveal gender influences of these processes (Desertification/land degradation in Turkey report) and, in line with these findings, develop a strategy proposing innovative perspectives and techniques to mitigate desertification/land degradation.	Desertification/land degradation in Turkey report			2015-2018	OSİB (ÇEM)	GTHB, ÇŞB, OSİB (OGM)
		1.2.2. Implementation of awareness raising studies about sustainable use of forests, agricultural lands and pastures as well as preserving soil and water resources to target women as well.	Agriculture consultant	Number	500000	2015-2018	GTHB (BÜGEM, GKGM, EYYDB), OSİB, İŞKUR	OSİB (DSİ), Governorates, Universities, NGOs, İŞKUR, PANKOBİRLİK
			Protected agriculture training provided to agricultural businesses	Number	225			

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
			Training deliveries about best practices of agriculture and organic farming; provided to farmers	Person	1200			
			Project designs to mitigate farmers' problems in the scope of agricultural innovation and information system	Number	50			
			Male and female farmers received integrated (biological) management in Farm Schools	Person	20000			
			Herd management personnel trained on reducing destruction of Grassland and Pastures	Person	26000			
			Organic manure use training deliveries	Person	500			
			Farmers received training on conscious use of water	Person	6250			
			Desertification/land degradation trainings delivered to animal breeders	Person	500	2015-2018	GTHB (HGM), OSİB (ÇEM)	
			Villagers received awareness raising training on preservation of land and water resources for sustainable use of forestlands	Person	2000	2015-2018	OSİB (OGM)	ORKOOP, UNDP, Universities, NGOs

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
			Best non-wood forest product production, agro forestry practices with respect to preservation of land, water and biological diversity in special afforestation areas and forests	Quantity	10	2015-2018	OSİB (OGM)	NGOs, Private sector
			E-training modules for harvest, storage, utilization and marketing of Non-wood forest products	Training module number	2	2015-2018	OSİB (OGM)	ORKOOP, UNDP, Universities, NGOs
	1.3. All stakeholders efficiently involved in combating desertification/land degradation processes, and defended against desertification.	1.3.1. Through campaigns and projects increase the number of people reached by NGOs, science and technology institutions and private sector regarding desertification/land degradation.	Campaigns and projects implemented by NGOs, BTKs and Private sector	Number	20	2015-2018	NGOs, BTKs, Private sector	
	1.4. Combating desertification/land degradation and mitigation of aridity included in higher education, formal and informal education programs.	1.4.1. Prepare support materials for trainers for combating desertification/land degradation processes to be covered in formal and informal education more efficiently, and include combating desertification/land degradation related images on the back cover of primary school work books.	Supporting training materials produced	Number	5	2015-2018	OSİB (ÇEM)	MEB, ASİB, GTHB
		1.4.2. Implement information program tailored for academicians teaching desertification/land degradation in universities; ensure students are aware of the significance of the issue as well as national and international innovative approaches on the subject.	Cooperating Universities	Number	15	2015-2018	OSİB (ÇEM)	

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
2. National and International Coordination and Cooperation Ensure efficient communication, coordination and cooperation between related national and international organizations and institutions; through international organizations, NGOs and TİKA ensure efficient cooperation and collaboration with countries mitigating desertification and land degradation, starting from Africa, Middle East and underdeveloped countries.	2.1. National legislation to coordinate international agreements prepared; efficient communication between existing national legislations and institutions ensured.	2.1.1. Implement necessary legislative amendments identified in National Capacity Action Plan and communication/coordination mechanisms between institutions to ensure efficient implementation of Rio agreements and necessary synergy among them.	Number of studies UKEP priorities are integrated to	Quantity	10	2015-2018	HM, DB, KB, OSİB	GTHB, ÇŞB
		2.1.2. Ensure plans, programs and projects about desertification/land degradation are in line with priorities and perspective of Rio agreements.	Number of plans/projects in line with Rio agreements	Quantity	10	2015-2018	OSİB (ÇEM)	OSİB, GTHB, ÇŞB
		2.1.3. Design systems in required subjects to ensure more efficient communication and decision processes between institutions about natural habitat management.	Developing and implementing a system for coastal zone management	Quantity	1	2016-2018	ÇŞB (MPGM)	OSİB, UDHB
	2.2. Partnership and cooperation agreements to combat desertification/land degradation signed with other countries and international organizations; national and international cooperation projects are planned and implemented with high level participation/cooperation and coordination.	2.2.1.,Desertification/land degradation, aridity towards Africa, Middle Asia, Middle East, Balkans and Caucasian countries. Increase technical cooperation support and capacity building on subjects such as protected agriculture, organic farming, water harvest etc.; sign bilateral cooperation agreements, joint economic commission protocols and memorandum of understanding, and implement cooperation projects together with these countries.	International training deliveries	Number	40	2015-2018	OSİB (ÇEM), GHTB (TAGEM)	FAO, TİKA, OSİB (OGM)
			Trainees	Person	500	2015-2018	OSİB (ÇEM), GHTB (TAGEM)	FAO, TİKA, OSİB (OGM)
			Workshop countries	Number	5	2012-2022	OSİB (ÇEM)	OSİB (OGM, DSİ), GTHB, TİKA, FAO
			Agreements with other countries	Number	40	2015-2018	OSİB (ÇEM)	GTHB, ÇŞB
			Project implementations in the scope of FAO Turkey Partnership Program	Number	15	2015-2018	GTHB (EUDİGB)	FAO, DB, OSİB, TİKA
		2.2.2. Improve cooperation on desertification/land degradation with international organizations, starting from United Nations.	Cooperating institutions	Number	3	2015-2018	OSİB (ÇEM)	ÇŞB, OSİB, GTHB

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
		2.2.3. Ensure active participation and contribution to international processes, meetings and forums in the scope of United Nations Convention on Combating Desertification; host important meetings and, encourage related institutions to open agencies in Turkey.	Attended COP, CST and CRIC meetings	Number	9	2015-2018	OSİB (ÇEM)	GTHB, OSİB
			Hosted meetings and conferences	Number	2	2015-2018	OSİB (ÇEM)	GTHB, ÇŞB, OSİB
			Establishing International Combating Desertification Research and Training Center in Turkey (In collaboration with Conference on Interaction and Confidence Building Measures in Asia)			2018	OSİB (ÇEM)	OSİB, DB, AİGK/CICA, GTHB, ÇŞB
			Establishing UNCCD ANNEX 4 Countries (N. Mediterranean) Regional Coordination office in Turkey			2018	OSİB (ÇEM)	UNCCD, DB, TİKA, GTHB, ÇŞB
3. Political Framework Prepare the necessary political and legal setting to support combating desertification and land degradation.	3.1. Methods, tools and financial resources to integrate combating desertification/land degradation strategy and action plan to national action plans and programs, national and regional development plans, spatial plans and sectoral investment decisions/programs are identified and mobilized.	3.1.1. Ensure combating desertification/land degradation priorities are integrated to national and regional development plans and sectoral programs; in that regard ÇEM experts shall monitor and contribute to related planning activities.	Plans in line with Combating desertification/land degradation priorities	Number	4	2015-2018	OSİB (ÇEM)	KB, GTHB, OSİB, ÇŞB

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
			Combating desertification measures integrated to annual implementation programs	Activity Number	10	2015-2018	KB	OSİB (ÇEM)
		3.1.2. Combating desertification/land degradation priorities included in environment impact assessment plans and environmental plans as well as integrated coastal management studies; ensure land preservation projects implemented in the scope of sectoral investments involve land degradation priorities.	Regulatory protocols and/or official letters between institutions	Quantity	2	2015-2018	GTHB, OSİB (ÇEM)	OSİB, ÇŞB, OSİB (DSİ)
	3.2. Legal, financial and socio-economic challenges as well as overlapping and duplications in different laws and legislation about combating desertification/land degradation are identified and necessary legislative amendments are made; also legislation is harmonized in the framework of combating desertification / aridity.	3.2.1. Establish and activate expert and working groups to identify legal, financial and socio-economic challenges in combating desertification/land degradation, and report results.	Desertification/land degradation in Turkey report			2015-2018	OSİB (ÇEM)	GTHB, ÇŞB, OSİB (OGM)
			Established and functioning expert working groups	Quantity	5	2015-2018	OSİB (ÇEM)	GTHB, ÇŞB, Universities, NGOs
		3.2.2. Implement legislation based measures to mitigate desertification/land degradation related problems.	Legislative amendments to prevent misuse of agricultural and pastures	Quantity	2	2015-2018	GTHB	OSİB

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
			Legislative amendment to determine the agricultural irrigation costs based on the amount of water and product types	Quantity	1	2015	OSİB (DSİ)	GTHB, İÖİ, Ziraat Bank, Cooperatives
			Legislative amendment regarding definition of preserved land	Quantity	1	2015-2018	OSİB (DKMP)	ÇŞB (TVKGM)
			Legislative amendments about misuse of forestland and special afforestation, agricultural forestry and Non-wood forest products production	Quantity	3	2015-2018	OSİB (OGM)	ÇŞB, GTHB
4. Science and Technology, Monitoring and Evaluation Produce and share information and data by means of research, technology development, monitoring and evaluation activities on Combating desertification and	4.1. A national Monitoring and Evaluation System, based on qualified data and in line with country specifications is developed.	4.1.1. Prepare national maps that involves desertification, erosion and integrated watershed rehabilitation plans; develop and disseminate Monitoring and Evaluation systems.	Updated erosion risk map			2015-2016	OSİB (ÇEM)	GTHB (TAGEM), ÇŞB (CBSGM), TUBITAK, AFAD
			Turkey Desertification report and Turkey Risk Map			2015-2016	OSİB (ÇEM)	GTHB (TAGEM), ÇŞB (CBSGM), TUBITAK, AFAD
			Watershed Monitoring and Evaluation System			2015-2016	OSİB (ÇEM)	TUBITAK
		4.1.2. Ensure necessary technical, methodological infrastructure and hardware for efficient monitoring of forest ecosystems.	Amount of land to make National Forestry Inventory (amount is not certain yet)			2015-2018	OSİB (OGM)	OSİB, GTHB, ÇŞB, Governorates, Universities, NGOs

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
land degradation and mitigate impact of aridity on the international, national and regional levels.			Permanent observation points affected by air pollution and climate change level 1	Number	818	2015-2017	OSİB (OGM)	
			Permanent observation points affected by air pollution and climate change level 2	Number	52	2015-2018	OSİB (OGM)	
			Inventory follow-up system to monitor non-wood forest products' area change in forest ecosystems	Ha	1074433	2012-2018	OSİB (OGM)	Universities, Forestry Research Institutes
			Forest Inventory Management Information System and "area inventory" and "biological diversity inventory" to run under this system			2015-2016	OSİB (OGM)	
		4.1.3. Build agriculture database for Turkey and prepare e-records of pasture assets.	Number of Agriculture Information System (TBS) Modules	Quantity	30	2015-2018	GTHB (TRGM)	GTHB, OSİB, ÇŞB, DSİ
			Area of established Land Parcel Identification System (LPİS)	km2	790000	2015-2018		
			Area included to Pasture Information System (MERBİS)	Ha	3 million	2015-2018		
		4.1.4. Implement/improve an efficient monitoring system to monitor presence and quality of water in Turkey.	Number of watersheds monitored for water quality and presence	Number	25	2015-2018	OSİB (SYGM)	OSİB (DSİ), Governorates
		4.1.5. Prepare annual national evaluation reports presenting progress on desertification/land degradation.	Annual evaluation reports	Number	4	2015-2018	OSİB (ÇEM)	GTHB, OSİB (OGM), ÇŞB, NGOs

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
		4.1.6. Implement online data collection and reporting software to monitor combating desertification action plan.	Online reporting database			2015-2015	OSİB (ÇEM)	
	4.2. Data and information about the interaction between desertification, aridity and climate change in affected areas are produces with respect to scientific and traditional information.	4.2.1. Implement research projects and share results with related institutions to identify climate change's possible effects on natural habitats, biological diversity, agriculture lands and pastures as well as necessary harmonization	Research projects on agriculture and pastures harmonization practices	Number	10	2015-2018	GTHB (TAGEM)	OSİB (OGM), AFAD, Universities, NGOs
			Research projects on forestry harmonization	Number	5	2015-2018	OSİB (OGM)	AFAD, Universities, NGOs
		4.2.2. Identify, report and share good practices in the framework of combating desertification/land degradation in Turkey. (LADA- Monitoring of Land Degradation Assessment in Dry lands and Sustainable land management Assistance and Best Practices Project)	Best practices report			2015-2018	OSİB (ÇEM)	GTHB, OSİB (OGM), TTBD, NGOs
		4.2.3. Identify and report traditional methods used by women and the general society about combating desertification, aridity and adapting climate change; investigate impact of desertification and land degradation on gender and socio economy of the society.	Related reports and publications	Number	10	2015-2018	OSİB (ÇEM)	GTHB, Universities, NGOs
	4.3. Risk analysis and management activities implemented on the national level.	4.3.1. Aridity risk estimation and crisis management in the framework of Agricultural Aridity Action Plan.	Annual reports	Quantity	2	2013-2017	GTHB (TRGM)	Agricultural Aridity Management Coordination Committee
			Number of completed ponds in regions under aridity risk	Quantity	1000	2015-2017	OSİB (DSİ)	
			Land hygrometry stations	Quantity	1200	2015-2018	GTHB (TRGM)	OSİB

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
		4.3.2. Develop monitoring and early warning systems based on modern technology to ensure more efficient forest protection and firefighting.	Forest land covered by the system	Ha	4 million	2015-2017	OSİB (OGM)	Universities, TUBITAK
			Average burned land by fire incidents	Ha	2,8	2015-2017		
		4.3.3. Prepare and implement risk reports in the scope of monitoring forest health.	Annual forest risk reports			2015-2018	OSİB (OGM)	
		4.3.4. Assess Watershed Based Monitoring System as a risk monitoring tool.	Watershed Monitoring and Evaluation System			2015-2016	OSİB (ÇEM)	TUBITAK
		4.3.5. Increase the number of Meteorological Observation Stations in Turkey and improve geographical distribution to ensure more efficient monitoring of aridity.	Automatic MGİ to be established	Quantity	400	2015-2017	OSİB (MGM)	
			Meteorology radars to be established	Quantity	7	2015-2017	OSİB (MGM)	
			Airport and sea automatic MGİ to be established	Quantity	15	2015-2017	OSİB (MGM)	
	4.4. Common and integrated R&D and technological advancement projects and activities are conducted in coordination, publicized and implemented.	4.4.1. Extend R&D practices on product pattern in conformity with soil type, land capability and the amount of water in agricultural lands, controlled irrigation and, using right inputs.	Research and pilot implementation on low-till and no-till farming	Quantity	10	2015	GTHB (TRGM)	Universities, Research centers, NGOs
			Types of xeromorphic products	Quantity	Upon development	2015-2018	GTHB (TAGEM)	
			Research on drainage and reuse of decontaminated waste water in irrigation	Quantity	1	2017	GTHB (TAGEM)	GTHB, OSİB (SYGM, DSİ)
			Water harvest, technique and technology improvement	Quantity	8	2015-2018	GTHB (TAGEM)	OSİB (DSİ), Universities
			Research and implementation projects to identify xero-tolerant and salinity tolerant immediate vegetation	Quantity	2	2015-2018	GTHB (TAGEM)	

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
		4.4.2. Research studies regarding sustainable forest management (SFM) approaches, forest preservation, rehabilitation of spoiled lands, and adapting climate change to improve sustainable use.	Research on xerotolerant types; tree nursery, seed research techniques; combat with fire, insects and diseases; improving biological diversity and ecosystem services in wood and non-wood product production	Quantity	10	2015-2018	OSİB (ÇEM, OGM)	NGOs
			A report on good practices, experience, lessons learned in Burdur, Konya, Ankara and Elazığ etc.	Quantity	1	2015-2018	OSİB (ÇEM, OGM)	
			Implemented research Outputs	Quantity	10	2015-2018	OSİB (OGM)	OSİB (ÇEM), NGOs
5. Administrative Structure and Institutional Capacity Building Identify necessary capacity building requirements to improve efficiency of public and non-public institutions, and implement the plan to fulfill those requirements.	5.1. Capacity assessment of the current situation in Turkey in combating desertification/land degradation is done, and respective action plans are put in action.	5.1.1. Update land use in EU-standards in the framework of Identify and Improve Problematic Agricultural Land Project (STATİP).	Updated satellite images	Area	790 bin km2	2015-2018	GTHB (TRGM)	
		5.1.2. Necessary analysis for capacity building of institutions on desertification/land degradation (Desertification and Land degradation in Turkey Report) and delivery of a respective training program.	Training program			2015-2018	OSİB (ÇEM)	GTHB, ÇŞB
		5.1.3. Collect and present best practices in Turkey about desertification/land degradation.	Best practices report	Quantity	1	2015-2018	OSİB (ÇEM)	GTHB, ÇŞB
	5.2. Qualified human resources raised in Combating desertification/land degradation.	5.2.1. Improve in-service training programs in the scope of OSİB and GTHB with respect to sustainable forest and land management approach.	Number of trained staff	Person	1000	2015-2018	OSİB (ÇEM)	GTHB, ÇŞB

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
		5.2.2. Improve capacity building activities towards technical staff and decision makers in related public bodies on Sustainable land management (SLM), Sustainable forest management (SFM), integrated watershed rehabilitation planning and integrated coastal management approaches.	Integrated coastal zone management training	Person	200	2015-2018	ÇŞB (MPGM)	
			Technical staff trained on SLM/SFM	Number	50	2015-2018	OSİB (ÇEM)	GTHB
		5.2.3. Expert exchange programs to share experiences in line with agreements, protocols and contracts to which Turkey is a party.	Experts attended to programs	Number	10	2015-2018	GTHB	OSİB, ÇŞB
		5.2.4. Increase research and technological advancement capacity of universities and research centers on combating desertification/land degradation.	Number of trained institutions	Number	10	2015-2018	GTHB (TAGEM)	OSİB, ÇŞB, Universities
	5.3. Improved contribution and participation of NGOs such as unions, foundations and cooperation as well as Private sector in combating desertification/land degradation processes and activities.	5.3.1. Implement training deliveries and cooperation programs towards NGOs and Private sector that are working on or influenced by desertification/land degradation.	NGO/Private sector representatives participated in training	Person	100	2015-2018	OSİB (ÇEM)	GTHB
			Number of projects implemented in cooperation with NGOs and Private sector	Quantity	10	2015-2018	GTHB (TAGEM)	GTHB, OSİB (DSİ), TÜS-KOOPBİR, SUBİRDER, NGOs, Private sector
			Irrigation cooperative and union representatives participated in trainings	Person	2000	2015-2018	GTHB (EYYDB)	GTHB, OSİB (DSİ), PANKOBİRLİK, TÜS-KOOPBİR, SUBİRDER

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
6. Finance Increase funds and efficiency and effectiveness of using these funds in combating desertification and land degradation; improve financial cooperation in technology transfer on the international level.	6.1. Financial incentives (loans, grants) and technical assistance mechanisms are built and necessary fund raising ensured to prevent desertification/land degradation, mitigate aridity, rehabilitate effected lands and ensure relevant population development; to develop technology, to implement and share best practices.	6.1.1. Improve income variety, ensure employment, and decrease dependency of and pressure on forest peasants on forest (including non-registered regions) to ensure socio-economic welfare of forest peasants.	Loan granted forest village households	%	38,4	2017	OSİB (OGM)	GTHB, UNKP, ORKOOP
			Loan granted cooperatives	Number	100	2015-2018	OSİB (OGM)	GTHB, UNKP, ORKOOP
			Increase in the number of cooperatives working in line with the legislation and with unit prices in afforestation, rehabilitation and erosion control works.	Number of increased cooperatives	100	2015-2023	OSİB (OGM)	GTHB, ORKOOP
		6.1.2. Implement a grant mechanism for NGOs to empower combating desertification/land degradation.	Grant mechanism to combat desertification and land degradation			2015-2018	OSİB (ÇEM)	GTHB, OSİB
		6.1.3. Disseminate incentives and supports for efficient irrigation in line with water economy as well as protective techniques and applications to ensure sustainable agricultural land (including sleep land) use.	Pressure irrigation provided lands	Desertification	40000	2015-2018	GTHB (TRGM)	OSİB (DSİ)
			Farmers benefited from incentives regarding environment friendly agricultural practices (IPARD II)	Number	21000	2015-2017	GTHB (BÜGEM)	KB, MB, EB, GTB, BTSB
			Contracted farmers for soil conservation agriculture (IPARD II)	Number	250	2015-2020	GTHB (BÜGEM)	KB, MB, EB, GTB, BTSB
			Contracted farmers for water protected agriculture (IPARD II)	Number	50	2015-2020	GTHB (BÜGEM)	KB, MB, EB, GTB, BTSB
			Municipalities and villages to benefit from Pasture rehabilitation and management project supports	Number	4000	2015-2018	GTHB (BÜGEM)	OSİB (OGM)
			Businesses to benefit from biological and biotechnical combat incentives	Quantity	20000	2015-2017	GTHB (GKGM)	

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
		6.1.4. Preserve necessary funds for research to identify most suitable methods and technology in sustainable land management, as well as new technology harmonization.	Allocated funds for technology harmonization	TL	Annual planned amount	2015-2018	OSİB (ÇEM), GTHB	OSİB (OGM)
			Number of researches	Number	10	2015-2018	OSİB (ÇEM), GTHB	OSİB (OGM)
	6.2. Necessary steps to allocate international funds for combating desertification/land degradation are identified, investment schemes and plans are developed to transfer funds to effected population and ecosystems.	6.2.1. Project designs and cooperation to receive support from international funds.	Project designs	Number	3	2015-2018	OSİB (ÇEM), GTHB	
7. Sustainable land management Identify integrated preservation measures and rehabilitation practices focused on climate change to preserve biological diversity and ecosystem services towards affected and likely to be	7.1. Ecosystems, trends and lands affected by desertification/land degradation, which are at risk and sensitive are mapped and priority subjects are identified. (Note: Actions stated under 4.1. also contribute to this output.)	7.1.1. Identify potential afforestation areas and afforestation priorities; disseminate this approach.	Area of prioritized land	Ha	1200000	2015-2018	OSİB (ÇEM)	OSİB (OGM)
		7.1.2. Define and classify all qualities and abilities of agricultural land; build infrastructure i.e. database; prepare soil and interpretation maps.	Defined and classified agricultural land	Ha	4 million	2015-2017	GTHB (TRGM)	İB, KB, MB, ÇŞB (TKGM), OSİB, Universities

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
affected zones and ecosystems; implement them through sustainable management mechanisms.	7.2. Land use codes in areas affected from desertification/land degradation as well as potential desertification lands are identified, legal measures are taken to prevent inability use.	7.2.1. Adopt and implement Spatial Strategic Planning approach at least in one region to ensure upper scale and participative land use in Turkey.	Prepared MSP (Spatial Strategic Planning) plan	Quantity	1	2015-2017	ÇŞB (MPGM)	OSİB, GTHB
		7.2.2. Identify development axes to implement and disseminate agricultural land use plan and projects; locate and monitor changes in agricultural land.	Legal arrangements to realize implementation and dissemination agricultural land use plan and projects	Quantity	1	2015-2017	GTHB (TRGM)	OSİB (DSİ), Governorates
			Provinces with identified development axes	Number	81	2015-2017	GTHB (TRGM)	
			agricultural land with identified land use changes	Ha	720000	2015-2017	GTHB (TRGM)	OSİB, ÇŞB, TUIK
	7.3. Special approaches for affected zones are developed to decrease soil loss and erosion sensitivity of land (Suitable cultivation and rehabilitation, irrigation, fight with soil and water contamination, organic farming and good farming practices, afforestation, rehabilitation of spoiled forest techniques, methods and soil preservation strategies), respective adjustments are made and implemented in plans and projects accordingly.	7.3.1. Suitable erosion control practices in priority areas under erosion risk.	Erosion controlled land for	Ha	400000	2015-2018	OSİB (OGM)	OSİB (ÇEM, DSİ), GTHB, Local Administration, NGOs
		7.3.2. Prepare rehabilitation plans for pastures and in-forest pastures; implement respective rehabilitation practices in line with biological diversity and ecosystem services preservation.	Pastures for rehabilitated forest	Ha	50000	2015-2018	OSİB (OGM)	GTHB, Universities, NGOs
			Rehabilitated pastures	Ha	140000	2015-2018	GTHB	
		7.3.3. Realize activities, particularly integrated watershed rehabilitation practices, river watershed management plans and management plans for holistic and participative preservation and development of natural resources in line with sustainable land management principles.	Integrated watershed rehabilitation project under implementation	Quantity	10	2015-2018	OSİB (OGM)	UNDP, FAO, OSİB (DKMP), JICA, NGOs, Universities
			Completed river watershed management plans	Number	25	2015-2023	OSİB (SYGM)	OSİB (ÇEM, DSİ, OGM, DKMP, MGM), ÇŞB, GTHB
			Completed flood management plans	Number	25	2015-2020		
			Completed aridity management plans	Number	25	2015-2020		

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
			Dam watershed with green belt afforestation	Number	260	2015-2017	OSİB (ÇEM, OGM)	OSİB (OGM), DSİ, Local Administration
			Rehabilitated flood watershed	Number	200	2015-2017	OSİB (ÇEM, OGM)	OSİB (OGM), DSİ, Local Administration
		7.3.4. Implement practices for holistic and participative preservation, development and prevent contamination of agricultural lands and pastures in line with sustainable land management principles; and disseminate climate friendly agricultural practices.	Completed areas for land consolidation and infield development	Ha	4 million	2015-2017	GTHB (TRGM)	MB, OSİB (DSİ), ÇŞB (TKGM), Governorates
			Problematic agricultural land (saline-alkaline) rehabilitated with closed drainage practices	Ha	265900	2015-2017	GTHB (TRGM)	DSİ, BKİ
			Rate of observed agriculture-based contamination in water	(%)	19	2015-2018	GTHB (TRGM)	GTHB, OSİB (SYGM), TUBITAK, Universities
			Land convert to pressure irrigation systems	Ha	140000	2016-2018	OSİB (DSİ)	GTHB, Governorates
			Mechanic wind erosion control methods, biological measures and windbreak projects in agricultural lands and pastures	Quantity	5	2015-2018	OSİB (ÇEM)	GTHB (TAGEM)
			Farmers and businesses benefiting from Environmentally Based Agricultural Land Protection Project (ÇATAK)	Ha	100000	2015-2017	GTHB (BÜGEM)	KB, MB, EB, GB

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
			Breeders with best practices	Number	12000	2015-2017	GTHB (BÜGEM)	KB, MB, EB, GB
			Entrepreneurs with Organic farming activities	Number	90000	2015-2017	GTHB (BÜGEM)	
		7.3.5. Complete product patterns in conformity with natural assets and environment as well as soil type and land ability based on agricultural land in all provinces; revise product pattern maps in line with water constraint; encourage product pattern changes.	Provinces with completed practices	Number	81	2015-2017	GTHB (BÜGEM)	OSİB (DSİ, MGM), GTHB (TAGEM, TRGM)
			Completed stakeholder meetings	Quantity	89			
	7.4. Amelioration practices in forest, moorland, pasture, wetland, coastal zone and other natural habitats in line with natural ecosystem structure.	7.4.1. Build spoiled forest lands especially dry land forests in line with SFM criteria; afforestation by using suitable methods and types to increase forest lands.	Afforested land	Ha	150000	2015-2018	OSİB (OGM)	OSİB (TKGM), NGOs
			Rehabilitated land	Ha	500000	2015-2018	OSİB (OGM)	
			Ratio of forest lands over total country land	%	30	2023	OSİB (OGM)	
		7.4.2. Identify wood and non-wood product and services in forests, pastures and other lands; prepare sustainable exploitation plans in line with exploitation and preservation balance.	Inventoried forest land with respect to ODOÜ Inventory Follow-up System (ETS)	Ha	2146000	2015-2017	OSİB (OGM)	Universities, ORKOOP
			Natural Flower Bulb Expert Committee meetings to identify flower bulb collection quotas	Number	5	2015-2018	GTHB (BÜGEM)	
		7.4.3. Increase the amount of forest lands with sustainable forest management certificate.	Certified forest land	Ha	4 million	2015-2017	OSİB (OGM)	Certification bodies, ORKOOP, MEB (HBÖGM)

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
		7.4.4. Develop land degradation and hydraulic functions indicators, inventories and evaluation methods, prepare functional management plans, and make necessary revisions in forest management planning guide and regulations for sustainable forest management.	Notification of preparing updated forest management plans including SFM indicators, inventory and evaluation methods (guide)			2018	OSİB (OGM)	OSİB (ÇEM), UNDP, NGOs, Universities
			Functional plans completed forest lands	Ha	8 million	2015-2018	OSİB (OGM)	OSİB (ÇEM), UNDP, NGOs, Universities
			Forest management plans including adaptation of forest management to climate change (on business management level)	Quantity	10	2015-2018	OSİB (OGM)	Universities and NGOs
		7.4.5. Implement and disseminate good practices of efficient heathland management.	Implemented projects/activities	Number	4	2015-2018	OSİB (OGM, DKMP)	OSİB (OGM)
		7.4.6. Improve efficiency of moorland habitat preservation management in moorland preservation areas.	Updated management plan	Number	2	2015-2018	OSİB (DKMP)	
		7.4.7. Run ecological improvement and restoration pilot studies in wetlands with semi or full spoiled ecological character.	Ecological restoration and improvement activities in wet lands	Number of areas	4	2015-2018	OSİB (DKMP), ÇŞB (TVKGM)	OSİB (DSİ)
		7.4.8. Complete integrated watershed management plans in 25 watershed in Turkey, and describe sectoral and natural water requirements in that respect.	Number of completed integrated watershed management plans	Quantity	25	2015	OSİB (SYGM)	GTHB
			Number of completed integrated river watershed management plans	Quantity	25	2015-2020	OSİB (SYGM)	

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
		7.4.9. Implementation of the regulation involving restoration measures and good practices to be completed in pursuit of HES, RES, thermal energy etc. power generation plant constructions.	Enacted directives	Quantity	1	2015-2018	OSİB (DKMP)	ÇŞB, GTHB
		7.4.10. Prepare and implement Mine Sites Rehabilitation Action Plan.	Action Plan			2015-2018	OSİB (ÇEM, OGM)	ÇŞB (ÇYGM), ETKB (MİGM)
		7.4.11. Plan Turkey coastal zone in line with Integrated Coastal Zone Management approach.	A plan for all coastal cities			2015-2018	ÇŞB (MPGM)	
		7.4.12. Prepare and implement a guide specific to regions, excludes off-site species and a collection of practices to preserve natural dune habitats in the scope of fighting with dune erosion in coastal zone; revise ongoing dune erosion activities conducted by related institutions, accordingly.	Coastal erosion implementation guide			2015-2016	OSİB (ÇEM)	OSİB (OGM, DKMP), GTHB (TAGEM), ÇŞB (MPGM)
		7.4.13. Disseminate efficient use of policies to eliminate all types of contaminating wastes, and take precautions.	Rate of municipality population served by sanitary landfill	%	85	2015-2017	ÇŞB (ÇYGM)	
			Ratio of treated waste water used in agricultural irrigation to produced waste water (%)	%	30	2023		

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
	7.5. Contributed to decreased emission through climate friendly agricultural practices and approaches to increase carbon sink capacity of habitats.	7.5.1. Announce new preservation areas including forest lands and sea, coastal zone, rivers, peatlands and other habitats that are underrepresented in national preservation sites system but is significant in terms of carbon conservation and adaptation.	Number of new preservation areas	Quantity	5	2015-2018	OSİB (DKMP), ÇŞB (TVKGM)	
		7.5.2. Prepare roadmap to implement and disseminate reference practices towards carbon conservation in natural ecosystems especially forests and production sites.	Forestry department where carbon holding capacity pilot studies in the scope of arid land forestry are done	Quantity	5	2015-2018	OSİB (OGM)	ÇŞB, NGOs
			Amount of conserved carbon in the scope of Konya Watershed pilot study	CO_2 eq tones	70000	2015-2018	OSİB (ÇEM, OGM)	
			Case studies in wetland ecosystems	Quantity	2	2015-2018	OSİB (DKMP)	
			Area of applied FAO EX-ACT (Pre Implementation Carbon Offset Tool)	Ha	80000	2015-2018	OSİB (ÇEM)	OSİB (OGM)
			Research studies of methods to measure carbon preserved in soil	Quantity	3	2015-2018	GTHB (TAGEM)	ÇŞB, OSİB
		7.5.3. Modeling of climate friendly agricultural practices (mulching, reduced tillage, amelioration of spoiled land, advanced manure management) in line with emission reduction targets; and their dissemination in agricultural lands and pastures.	Treated agricultural lands	Ha	100000	2015-2018	GTHB (BÜGEM, TAGEM)	NGOs, Private sector
			Amount of conserved carbon in agricultural land in the scope of Konya Watershed pilot study	CO2 eq tones	22000	2015-2018	GTHB (TRGM)	OSİB (ÇEM, OGM)
			Amount of conserved carbon in pastures in the scope of Konya Watershed pilot study	CO2 eq tones	105000	2015-2018	GTHB (TRGM)	OSİB (ÇEM, OGM)

Operational objectives	Outputs	Actions	Definition of Indicator	Unit	Amount	Target years	Coordinating institutions	Cooperating and contributing institutions
			Best non-wood forest product production, agro forestry practices with respect to preservation of land, water and biological diversity in special afforestation areas and forests	Quantity	10	2015-2018	OSİB (OGM)	NGOs, Private sector
			E-training modules for harvest, storage, utilization and marketing of Non-wood forest products	Training module number	2	2015-2018	OSİB (OGM)	ORKOOP, UNDP, Universities, NGOs
	1.3. All stakeholders efficiently involved in combating desertification/land degradation processes, and defended against desertification.	1.3.1. Through campaigns and projects increase the number of people reached by NGOs, science and technology institutions and private sector regarding desertification/land degradation.	Campaigns and projects implemented by NGOs, BTKs and Private sector	Number	20	2015-2018	NGOs, BTKs, Private sector	
	1.4. Combating desertification/land degradation and mitigation of aridity included in higher education, formal and informal education programs.	1.4.1. Prepare support materials for trainers for combating desertification/land degradation processes to be covered in formal and informal education more efficiently, and include combating desertification/land degradation related images on the back cover of primary school work books.	Supporting training materials produced	Number	5	2015-2018	OSİB (ÇEM)	MEB, ASİB, GTHB
		1.4.2. Implement information program tailored for academicians teaching desertification/land degradation in universities; ensure students are aware of the significance of the issue as well as national and international innovative approaches on the subject.	Cooperating Universities	Number	15	2015-2018	OSİB (ÇEM)	

Annex 4: Strategy and action plans in operation closely related to desertification/land degradation in Turkey

Name of Strategy and Action Plan	Years Covered	Content
National Biological Diversity Strategy and Action Plan	Enacted in 2007	Action plan is prepared by DKMP. Plan aims to preserve biological diversity, ensure sustainable use of biological sources, ensure fair distribution of benefits from genetic resources in Turkey, and which is a party to Rio Agreements.
Turkish National Climate Change Strategy	2010-2020	Strategy is prepared by Ministry of Environment and Urban Planning. Strategy aims to decrease greenhouse gas emission; contribute to combating global climate change in the framework of "common but differentiated responsibilities", and in the scope of international cooperation with respect to combating climate change; design national reduction, harmonisation, technology, finance and capacity building policies towards climate change.
Turkey Climate Change Action Plan	2011-2023	Action plan is prepared by Ministry of Environment and Urban Planning. Plan envisages harmonisation of national and/or sectoral development strategies and climate policies with institutional structures and regulations; to ensure use of new and renewable energy sources that integrates climate change policies with development policies; provide high quality living and prosperity to all fellow citizens within a low carbon emission framework; and identify short, medium and long term objectives for combating climate change covering all sectors in Turkey.
Combating Erosion Action Plan	2013-2017	Action plan is prepared by ÇEM. Plan aims to protect soil sources from erosion; ensure more economic and efficient combat activity; ensure coordination between organisations and institutions fighting with erosion; efficient use of public resources; and conduct Afforestation, Rehabilitation, Erosion Control, Pasture Amelioration practices, as well as maintenance in the scope of combating erosion.
National Watershed Management Strategy and Action Plan	2012-2023	Action plan is prepared by OSİB. Plan aims to guide medium and long term resolutions on conservation, improving the sustainable use of watersheds and natural resources in Turkey; establish a strong integrated natural resource management political strategy to support sustainable living priority development agenda of Turkey and in line with EU environmental and water management standards.
Upper Watershed Flood Control Action Plan	2013-2017	Action plan is prepared by ÇEM. Plan aims to conduct afforestation, erosion control, terracing, sloping land amelioration, ephemeral amelioration, pasture amelioration and disturbed forest rehabilitation activities; to decrease upper watershed floods and regulate rainfall-water regime; and organise lower watersheds, river beds and city crossing.
Combating Flood National Action Plan	2013-2017	Action plan is prepared by ÇEM. In cooperation with all related institutions and organisations, the plan aims to identify upper watersheds, make pre-surveys, prepare and implement flood action plan activities by evaluation of potential flood watersheds with OGM and DSİ.

Dam Watersheds Green Belt Afforestation Action Plan	2013-2017	Action plan is prepared by OSİB. Plan aims to increase the amount and quality of water in dams; assessment of plain lands in conservation zones as well as drainage areas flooded from time to time; prevent erosion and sediment transport; provide new recreational and touristic areas, new carbon sinks and oxygen sources; creation of new shelters for wild life; and preferential income-generating species in afforestation.
Turkey Combating Agricultural Aridity Strategy and Action Plan	2013-2017	Action plan is prepared by GTHB. Plan aims to involve all stakeholders in the process by building public awareness, and ensuring minimum impact from aridity, with sustainable agricultural water consumption plans in off-drought seasons. The plan further aims to identify precautions needed for future inadequacy of water in cultivated lands related to aridity, and to monitor these measures.
Ministry of Food, Agriculture and Livestock Strategic Plan	2013-2017	Action plan is prepared by GTHB. Plan aims to preserve agricultural resources in Turkey in line with national development policies; ensure sustainable land management; ensure necessary technical, administrative and legal measures are taken for food security; and to take the necessary measures to improve living standards in rural areas.
Turkey Organic Farming Strategic Plan	2012-2016	Action plan is prepared by BÜGEM. Plan aims to regulate and improve production and marketing of organic farming by disseminating production and consumption of organic products to provide secure and quality products to customers, and to preserve ecologic balance and sustainability in agriculture.
National Wet Lands Strategy and Action Plan	2011-2015	Strategy and action plan is prepared by DKMP and aims to locate and make inventory of wetlands in Turkey; ensure their conservation and improvement; prepare national red lists for creatures dependent on wetlands and ensure their long term sustainability; conduct monitoring and ecological, economic and biological assessment of wetlands, with respect to the Ramsar Convention.
National Forestry Program	2004-2023	Program is prepared by abrogated Ministry of Environment and Forest. Program aims to ensure forestry studies are handled within the framework of development in a broad perspective; ensure planning and implementation of forestry studies is done in line with significant attention to changes and developments in forests from multi-dimensional expectations in society; and ensures necessary institutional capacity building and mechanisms for preparation, implementation, monitoring, evaluation and improvement of forest development policies and strategies within a participative approach.
Integrated Urban Development Strategy and Action Plan	2010-2023	Strategy and action plan is prepared by Ministry of Environment and Urban Planning. Plan aims to prepare a road map to improve viability and space-living quality of settlements; strengthening economic, social and cultural structures; and restructuring of the spatial planning system, improving space and living quality of settlements, and strengthening of the economic and social structure of settlements.

Annex 5: Monitoring and evaluation systems for desertification in Turkey

Monitoring project / system	Explanation
Watershed Monitoring and Evaluation System - HİDS (ÇEM)	Turkey Desertification Model and Risk Map will be produced by developing watershed Monitoring and Evaluation System and validating and calibrating previously identified Watershed Monitoring and Evaluation Model in the TUBITAK project implemented by the ÇEM General Directorate. At the end of the project, a Monitoring and Evaluation System capable of assessing data themes such as erosion, desertification, land use, forest and covering all watersheds will be developed. This system shall produce data towards strategic objectives to be reported to the PRAIS system. There is an " Establishing Turkey Desertification Model and Risk Map" work package in the scope of "Developing Watershed Monitoring and Evaluation System Project" implemented by Turkey's General Directorate in cooperation with TUBİTAK-BİLGEM. This work package shall identify desertification criteria and indicators, a desertification model tailored to Turkey, and desertification sensitive areas at the national level. At the moment, desertification criteria and indicators are identified and desertification model related studies are ongoing, through: • Literature Review • Identifying Desertification Criteria and Indicators • Identifying Desertification Model • Producing Desertification Risk Maps
National Desertification Monitoring System (ÇEM)	Establishment of national desertification and erosion monitoring systems to monitor practices of ÇEM General Directorate, conduct of soil conservation studies at the national level, and the building of a data archive is ongoing, and is expected to be finalised in 2015. Upon establishing the monitoring system, the updated desertification status shall be monitored with respect to soil type, topography and vegetation.
National Erosion Monitoring System (ÇEM)	ÇEM General Directorate is establishing an Erosion Monitoring System to monitor erosion related studies and to produce a data archive. Erosion maps, by watershed, have been prepared and are under testing and control.
National Sediment Monitoring System (ÇEM)	With the project implemented by ÇEM General Directorate, areas with large soil loss shall be identified; shall be compared with erosion risk maps produced in GIS environment by using RUSLE method; and priority areas shall be determined including dammed watersheds.
Dissemination of Good Practices in Land Degradation Project (ÇEM)	Monitoring of supports and good practices regarding Evaluation of Land Degradation in Arid Lands, as well as the Evaluation of Land Degradation and Sustainable Land Management Project, which is a joint attempt of United Nations Food and Agriculture Organization (FAO) and United Nations Convention on Combating Desertification towards land degradation, to disseminate Good Practices in Combat with Land Degradation by ÇEM General Directorate, is a part of an international project concerning Turkey.

Turkey Desertification Map (Climate Data)	This study is carried out to a. prepare desertification affectability map of Turkey based on Aridity Index of Turkey (Aİ) showing lands with desertification tendency, based on most homogenous, long-term and updated climatology data representative of climate and arid regions in Turkey; and b. prepare and identify "Desertification Affectability Intensity Class of Climatologically Desertification Potential Bearing Desertification Sensitive Lands or Plain Lands in Turkey" with respect to climate, climate change and aridity characteristics and aspects controlling desertification factors and processes. As a result of the study, a risk map is produced through identifying desertification affectability intensity class (desertification sensitivity) of desertification sensitive arid lands (semi arid, aridish-semi humid and humidish-semi humid) in Turkey Desertification risk maps shall be produced in the scope of identified desertification criteria and indicators; and changes in desertification shall be revealed with respect to regressive data.
Production of National Erosion Risk Maps (ÇEM)	ÇEM General Directorate prepares erosion risk maps based on watersheds and logs through a data archive. Watershed, micro- and sub-watershed borders are identified, and erosion risk maps showing the average annual potential and real soil loss and soil loss reaching streams, by using GIS technique in watersheds in Turkey. Approximated sediment amounts based on watershed is identified and results are still under evaluation.
Land Monitoring System (OSİB)	Web based application prepared by Ministry of Forestry and Water Affairs to present land cover data (1990-2000-2006), satellite images and statistical data produced out of these, through interpretation of images in line with European Environment Agency standard classification and methodology. System involves location data and statistical data. It is based on PostgreSql Database and developed with php and html coding. The system is working on OSİB server; and provides location data to Open Geospatial Consortium (OGC) standards; as Mapping, WMS and WFS over ArcGIS Server. http://aris.ormansu.gov.tr
Geographical Information System - Geodata (OSİB)	Geographical data produced by Ministry of Forestry and Water Affairs and affiliated institutions, as well as spatial data including administrative borders, is presented in this application. It is built on PostgreSql Database, and is coded as Open Source. The system works on OSİB servers, and provides spatial data to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://geodata.ormansu.gov.tr/

Noah's Ark National Biological Diversity Database (OSİB)	This is a web-based, publicly accessible database that enables users to access authorized data using a query function based on species, habitats and land type in order to monitor biological diversity in Turkey. It is an application providing verbal and geographical data. The system is built on Oracle10g Database and coded over Nety Framework with C# programming language. The system is working on OSİB server; service based access is used to reach the verbal data, and spatial details provided to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://www.nuhungemisi.gov.tr/Giris/index.aspx
Wild Life Central Hunting Commission Information System (OSİB)	This application involves location data to identify the limits of State Hunt, General Hunt, areas of banned hunting, Special Hunt, areas to improve wild life, and pilot hunting areas implemented by Ministry of Forestry and Water Affairs General Directorate for Nature Conservation and National Parks with respect to Central Hunting Commission resolutions published each year. It is built on PostgreSql Database, developed with php and html coding. The system is working on OSİB servers; and provides location data to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://mak.ormansu.gov.tr/
Forest Information System - Geodata (OGM)	It is an information system jointly used by OSİB, that monitors and controls forest assets in Turkey by using geographical information systems. It is built on PostgreSql Database, and coded as Open Source. The system is working on OSİB server and General Directorate of Forestry server; and provides location data to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://geodata.ogm.gov.tr/GeoDatav4p/index.aspx
Forest Information System - Geoportal (OGM)	It is an information system that uses tables and location data about forestry, monitors and controls forest assets in Turkey by using geographical information systems, where data entry and updating can be done by qualified staff. Developed using programming language C#, MXML+, Action Script3 software, built on MS SQL Database. The system is working on OSİB server and General Directorate of Forestry server; and provides location data to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://geodata.ogm.gov.tr/GeoDatav4p/index.aspx

Afforestation Database (OGM)	It is a GIS project towards collection ,evaluation and sharing of data regarding reforestation and revitalization of former forest lands, or afforestation of plain lands in Turkey. http://agac.ogm.gov.tr
OGM Permit Information System (OGM)	It is an information system where all types of forestry licenses are spatially identified, involves forestry related information and data entry and updating can be done by qualified staff. Developed by using C#, MXML+, Action Script3 software. It is built on MS SQL Database. The system is working on OSİB server and General Directorate of Forestry servers; and provides location data to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://izin.ogm.gov.tr/
OGM Cadastral Information System (OGM)	It is an information system that uses tables and location data about cadastral practices in forests, and monitors and controls the cadastral situation in forests in Turkey, by using geographical information systems, where data entry and updating can be done by qualified staff. Developed by using C#, software. It is built on MS SQL Database. The system is working on OSİB server and General Directorate of Forestry server; and provides location data to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://izin.ogm.gov.tr/
Water Database (DSİ)	It is a GIS application managed by DSİ General Directorate, jointly used by OSİB, that aims to collect all underground and above-ground water related data in Turkey using geographical information systems. It is built on PostgreSql Database, and coded as Open Source. The system is working on OSİB server and DSİ General Directorate server; and provides location data to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://geodata.dsi.gov.tr/GeoDatav4p/index.aspx
Meteorology Database (MGM)	This database project implemented by the Ministry aims at storing, assessing and presenting all meteorology related data in Turkey, using GIS. It is built on PostgreSql Database, and coded as Open Source. The system is working on OSİB server and General Directorate of Meteorology server; and provides location data to OGC standards; as Mapping, WMS and WFS over ArcGIS Server. http://geodata.mgm.gov.tr/GeoDatav4p/index.aspx

Aridity Monitoring System (GTHB and MGM)	Agricultural Harvest Monitoring and Estimation System (TARİT) is built to make seasonal and in-season harvest estimations, collect data to monitor aridity, and ensure respective departments of Ministry of Food, Agriculture and Livestock use the collected data as a tool for management support tool.
Agricultural Monitoring and Information System Project – TARBİL (GTHB)	Open Source Code Web Based GIS software developed by the Ministry of Food, Agriculture and Livestock uses tables and location data about agricultural practices (e.g. agriculture parcels produced with cadastral data, provincial support, and problems relating to insurance processes of problematic parcels); and it is planned that all sub-agriculture projects shall be included. Data collected from 200 ground stations (190 agricultural, 10 meteorological) devoted to the system are assessed with respect to aridity, rainfall, humidity, vegetation pattern, crop situation for example. The system can be accessed via link: http://tarbil.com/. With the new interface, it is possible to download images, monitoring fields, monitor aridity, follow up agricultural practices and agricultural-meteorological observations. Requires a user id and password, upon authorization.
Pasture Information System Development Project – MERBİS (GTHB)	Pasture Information System Development Project designed by Ministry of Food, Agriculture and Livestock, General Directorate of Vegetative Production aims to upload graphical and verbal data on pastures, summer pasture, winter quarters, pasture and public grasslands, forms the basis of husbandry, through query and reporting. In that regard, it is required to do what is necessary to ensure desk research, on online research and reporting of pasture parcels in provinces, towns and villages in Turkey. This will include publishing and monitoring development of all related data, as well as ensuring adaptation to the EU harmonsation process. The Pasture Information System will enable access to pasture information, classified by villages and to animal assets; and provide the basis for agricultural production and product planning.

Annex 6: Required Indicators in the PRAIS reporting system.

During the preparation of this annex, information from the following web links are utilized:
http://www.unccd.int/en/programmes/Capacity-building/CBW/Resources/Pages/5RC/Default.aspx?HighlightID=284
For Affected Country format
http://www.unccd.int/Lists/SiteDocumentLibrary/PRAIS/ACP_fillEUle_template_final_ENG_new.pdf
For Developed Country Format
http://www.unccd.int/Lists/SiteDocumentLibrary/PRAIS/DCP_fillEUle_template_final_ENG_new.pdf

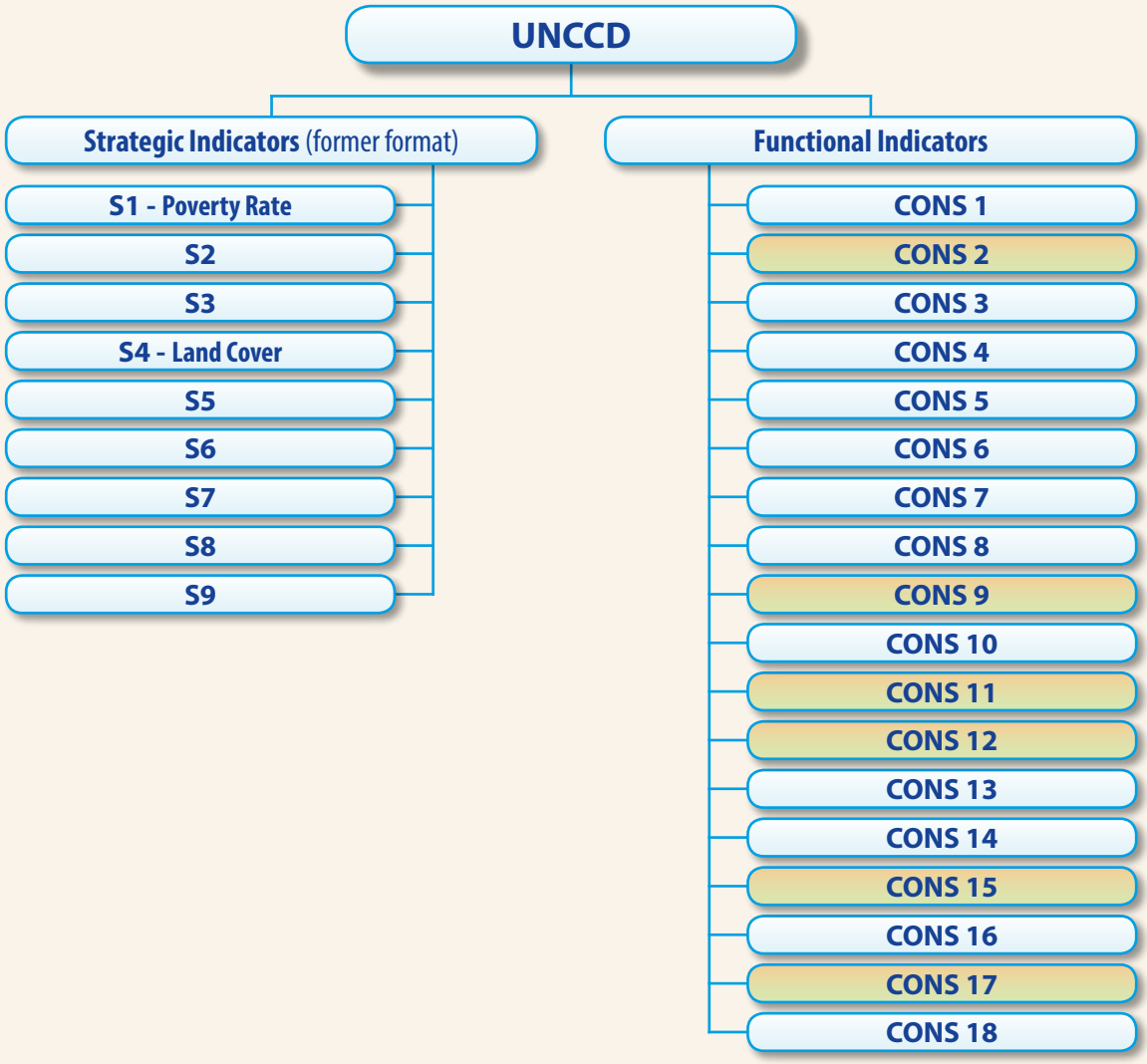


Table Strategic and operational indicators dealt in the scope of UNCCD.
(operational indicators that are not used in the new reporting system are highlighted in Pink. Strategic Objective indicators are being updated by UNCCD; although the format is not yet published, it is presented in the table to provide insight)
CONS: Stands for organised indicators proposed for operational objectives of the strategy.

4.1. Operational objective Indicators

5 operational objectives and 18 respective quantity indicators are identified in UNCCD 10 Year Strategy Document. As to the amendments in 2014, the indicators in the new reporting format are presented below.

Operational objective 1: Support, Awareness Raising and Training
Operational objective 2: Political Framework
Operational objective 3: Science, Technology and Information
Operational objective 4: Capacity Building
Operational objective 5: Funding and Technology Transfer

CONS-O-1: Developed Country Format
Number and scope of information meetings on Desertification /Land Degradation and Aridity (ÇEUUK) and/or ÇEUUK's climate change and biological diversity as well as synergy.

Global Objective: Percentage of population informed on ÇEUUK and/or ÇEUUK's *climate change and biological diversity as well as synergy*. For 2018 (30%)

National contribution to global objective: Percentage of national population informed on ÇEUUK and/or ÇEUUK's *climate change and biological diversity as well as synergy*

CONS-O-1: Affected Country Format
Number of and scope of information meetings on Desertification Land Degradation and Aridity (ÇEUUK) and/or ÇEUUK's *climate change and biological diversity as well as synergy, and the target group reached by settings based on ÇEUUK and ÇEUUK synergy.*

Global Objective: Percentage of population informed on ÇEUUK and/or ÇEUUK's climate change and biological diversity as well as synergy. For 2018 (30%)

National contribution to global objective: Percentage of national population informed on ÇEUUK and/or ÇEUUK's climate change and biological diversity as well as synergy

CONS-O-3: Developed Country Format
Number of non-governmental organisations (NGO) and Science and Technology institutions (BTK) participating to contractual processes.

Global Objective: During the implementation of the project, continuous increase in NGO and BTK participation to contractual processes has been achieved.

National contribution to global objective: Numbers of NGOs and BTKs participating to development support programs/projects related to ÇEUUK with respect to dates.

CONS-O-3: Affected Country Format
Number of Non-Governmental Organisations (NGO) and Science and Technology Institutions (BTK) participating to contractual processes.

Global Objective: Continuous growth in NGO and BTK participation to contractual processes during the implementation of the strategy.
National contribution to global objective: Numbers of NGOs and BTKs participating to development support programs/projects related to ÇEUUK with respect to dates.

Make a brief definition of the actions to ensure active participation of National NGOs and BTKs in contractual processes.

CONS O-4: Developed Country Format
Number and type of Non-Governmental Organisations' (NGO) and Science and Technology Institutions' (BTK) ÇEUUK related training initiatives
Global Objective: Continuous growth in the number of ÇEUUK related training initiatives implemented by NGOs and BTKs during the implementation of the strategy

National contribution to global objective: Number of ÇEUUK related training initiatives implemented by NGOs and BTKs

CONS O-4: Affected Country Format
Number and type of initiatives in the field of NGO and BTK training related to ÇEUUK.

Global Objective: Continuous growth in the number of ÇEUUK related training initiatives implemented by NGO and BTK during the implementation of the strategy.

National contribution to global objective: Number of ÇEUUK related training initiatives implemented by TKs and BTKs.

CON-O-5: Affected Country Format
Numbers of affected party countries, sub-regional and regional institutions completed preparation/review of UEP/EUEP/BEPs, in line with the contract and with respect to integration with investment frameworks, national plans and policies and biophysical and socio-economic information.

Global Objective: Percentage of affected party countries, sub-regional and regional institutions with completed preparation/review of UEP/EUEP/BEPs, in line with the strategy; (as of2014, ≥80%).

National contribution to global objective: In your country, do you have an UEP in conformity with the Strategy?

Yes ☐ No ☐

CONS-O-6: Developed Country Format
Number of partnership agreements in the framework of the contract between Developed partner countries / United Nations, international governmental organisations (IGO) and affected party countries.

Global Objective: Number of active UNCCD related partnership agreement in each affected partner country. As of 2014 ≥ 2.

National contribution to global objective: Number of partnership agreements made with affected partner country during reporting phase.

CONS-O-7: Developed Country Format
Number of initiatives for interactive (synergistic) planning/programming of three Rio agreements or mechanisms for their common implementation

Global Objective: Each affected partner country has a common national plan or functional mechanism(s) to ensure synergy between three Rio Agreements. (2014)

CONS-O-7: Affected Country Format
Number of initiatives for interactive (synergistic) planning/programming of three Rio agreements or mechanisms for their common implementation

National contribution to global objective: During the current reporting process, did your country implement initiatives for planning/programming of three Rio agreements?

Yes ☐ Yes, but only for two Rio agreements ☐ No ☐

During the current reporting process was there any operational mechanism to facilitate common implementation of Rio agreements?
Yes ☐ Yes, but only for two Rio agreements ☐ No ☐

CONS-O-8: Developed Country Format
Number of affected partner countries, sub regional or regional institutions to prepare and support national/sub regional/regional monitoring system for ÇEUUK.

Global Objective: Percentage of affected partner countries, sub regional and regional reporting institutions to prepare and support national monitoring system for ÇEUUK (as of 2018, ≥ 60%).

National contribution to objective (for developed): Number of monitoring systems established in affected partner countries, and/or sub regions/regions with your country's technical and/or financial support.

CONS-O-8: Affected Country Format
Number of affected partner countries, sub regional or regional institutions to prepare and support national/sub regional/regional monitoring system for ÇEUUK.

Global Objective: Percentage of affected partner countries, sub regional and regional reporting institutions to prepare and support national monitoring system for ÇEUUK (as of 2018, ≥ 60%).

National contribution to global objective: In your country is there a monitoring system built especially for ÇEUUK?
Yes ☐ No ☐

CONS-O-10- Affected Country Format
Number of reviewed UEP/EUEP/BEPs reflecting ÇEUUK factors, their interaction and the interaction between ÇEUUK and climate change & biological diversity.

Global Objective: Percentage of reviewed UEP/EUEP/BEPs successful in quality self-assessment (as of 2018, ≥ 70%).

CONS-O-13: Developed Country Format
Number of countries, sub regional and regional reporting institutions building capacity to combat ÇEUUK based on NCSA or other tools and methods.

Global Objective: Percentage of affected partner countries, sub regional and regional reporting institutions to implement capacity building plans or programs/projects for ÇEUUK ≥ 90%.

National contribution to global objective: Does your country support implementation of capacity building plans or programs/projects for ÇEUUK with respect to UKEP (National Capacity Action Plan)?
Yes ☐ No ☐

Does your country support implementation of capacity building plans or programs/projects specific to DLDD, based on other methods and tools to evaluate national capacity building needs?
Yes ☐ No ☐

CONS-O-13: Affected Country Format
Number of countries, sub regional and regional reporting institutions building capacity to combat ÇEUUK based on UKEP or other tools and methods.

Global Objective: Percentage of affected partner countries, sub regional and regional reporting institutions to implement capacity building plans or programs/projects for ÇEUUK ≥ 90%.

National contribution to global objective: Does your country implement capacity building plans or programs/projects for ÇEUUK with respect to UKEP?
Yes ☐ No ☐

Does your country implement capacity building plans or programs/projects specific to DLDD, based on other methods and tools to evaluate national capacity building needs?
Yes ☐ No ☐

CONS O-14: Developed Country Format
Number of affected partner countries, sub regional and regional institutions reflecting leveraged increasing of national, bilateral and multi-party resources for combat with ÇEUUK and that are established in integrated investment framework (EYÇ) developed by investment frameworks KM (Global Mechanism)or in other forms of EYÇs.
Global Objective: Percentage of affected partner countries, sub regional and regional reporting institutions developing advanced integrated investment frameworks (EYÇ) (as of 2014 ≥ 50%).

National contribution to global objective: Does your country support developing of one or more integrated investment framework?
Yes ☐ No ☐

CONS O-14: Affected Country Format
Number of affected partner countries, sub regional and regional institutions reflecting leveraged increasing of national, bilateral and multi-party resources for combat with ÇEUUK and that are established in integrated investment framework (EYÇ) developed by investment frameworks KM (Global Mechanism)or in other forms of EYÇs.
Global Objective: Percentage of affected partner countries, sub regional and regional reporting institutions developing advanced integrated investment frameworks (EYÇ) (as of 2014 ≥ 50%).

National contribution to global objective:
Does your country have an integrated investment framework?
Yes ☐ No ☐

CONS-O-16: Affected Country Format
Adequacy, timeliness and degree of predictability of financial resources provided to combat with ÇEUUK by developed countries.

Evaluation of bilateral support to implement the Contract and strategy during reporting phase:
Adequacy of bilateral support
Adequate ☐
Very Adequate ☐
Not Adequate ☐
Timeliness of bilateral support
Timely ☐
Very Timely ☐
Not timely ☐
Predictability of bilateral support
Predictable ☐
Very Predictable ☐
Not Predictable ☐

CONS-O-18: Affected Country Format
Type of initiatives and amount of financial resources ensuring access to technology provided by affected partner countries

Global Objective: Continuous increase in the financial resources allocated to enable access to technology by partner countries during the implementation of the strategy.
Increase in the number of reporting of economic and politic incentives during the implementation of the strategy.

National contribution to global objective: Estimated annual amount of allocated resources to enable access to technology

Has your country generated financial and political incentives to enable access to technology?
Yes ☐ No ☐

4.2. Strategic objective Indicators

In line with UNCCD 10 Year Strategy Document, 4 Quantity Strategic Objectives and their expected outputs are defined as below.

Strategic Objective 1 : Improve living conditions of people affected by desertification
Strategic Objective 2 : Improve conditions of affected ecosystems
Strategic Objective 3 : Ensure global benefit by effective implementation of UNCCD
Strategic Objective 4 : Support resources to improve cooperation between national and international actors, for more successful implementation of the Contract.

Objective	Output
Strategic Objective 1	**SO 1-1:** Tendency of the population living in affected lands, under poverty line and/or suffering from income inequality
	SO1-2: Tendency in access to clean drinking water in affected areas
Strategic Objective 2	**SO2-1:** Tendency in land cover
	SO2-2: Tendency in land productivity or functionality
Strategic Objective 3	**SO3-1:** Tendency in carbon supplies underground and aboveground
	Tendency of the amount and distribution of selected types

Progress Indicators

The progress indicators of previous reporting period of PRAIS known as impact indicators aims to follow up the progress in Strategic Objectives of the strategy.

CRIC assumed the evaluation of practices with respect to the information provided by partner countries and other stakeholders. Progress indicator related information that measures the success of "Strategic Objectives" of the strategy is assessed once in every four years.
The next reporting period to provide the necessary information about progress indicators is planned to start in 2016 by UNCCD.

For the next reporting period, the secretariat is getting prepared to update the existing guide with respect to the suggestions of CST (Science and Technology Committee) on reporting progress indicators.

Annex 7: Usability of the data sources to be collected and things to be done.

(Taken from the practices of TUBITAK-BİLGEM in the scope of "Potential Afforestation Lands Database and Developing Watershed Monitoring System Project" Existing Situation Analysis and Identifying Needs Technical Consultancy Services" done for Directorate General of Combating Desertification and Erosion.)

Table : List of data sources

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
1	**Erosion Maps**	Yes	Partly usable	Quantitative	Updated	Requires rehabilitation.	High
2	**Erosion Intensity Classes(Soil Maps)**	Yes	Partly usable	Quantitative	Not updated	Requires to be updated and rehabilitated. Usability would increase when used with an updated and highly accurate vegetation database and would be successfully used in planning of afforestation of plain lands against erosion. Identification of forest-pasture and plain rock surfaces in detail in watersheds by using orthophotograph would increase the usability of existing Erosion Intensity Classes database.	High
3	**Soil Erosion Sensitivity (K Factor)**	Yes	Usable	Quantitative	Updated	"Erosion Intensity Classes" and Soil Erosion Sensitivity percentages can be compared and statistically mutually assessed. All Soil Erosion Sensitivity related studies carried out by Soilwater General Directorate, Rural Services General Directorate, Research Institutes as well as all land studies and measurements done in the scope of TAGEM-Pasture can be included in this study. This may generate more reliable bases. TAGEM soil wearability figures (K Factor) is taken at 15.000 Quantity measurement point throughout Turkey. It has to be quantified and coordinated to be transferred to GIS environment.	Medium

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
4	**Sediment Transfer Rate %**	Yes	Partly usable	Quantitative	Updated	No detailed sediment transfer rate identified adopting an approach of analysis of all watershed characteristics, or multi-parameter model approach is available. The values calculated by using acreage of 14.608 micro watershed registered in watershed Database are available as quantitative data. DSİ would start a sediment transfer rate study by using watershed characteristics collected from related stations or by direct measurement.	Low
5	**Sediment Characteristics-Sediment Observation Stations**	Yes	Not Usable	Document	Updated	The information presented in the document shall be quantitatively arranged and correlated with station data and transferred to GIS environment.	Medium
6	**Landslide Inventory Maps**	Yes	Usable	Quantitative	Updated	x	x
7	**Landslide Hazard Maps**	No	Usable in the future	x	Under Preparation	AFAD is carrying out a project regarding landslide hazard maps. Can be of future use.	High
8	**Meteorological Stations, Meteorological Measurements**	Yes	Usable	Quantitative	Updated	Updated and Usable. Meteorological stations are not representative watersheds in quantity. Not enough stations to measure avalanche risk.	x
9	**Meteorological Radar**	Yes	Partly usable	Quantitative	Updated	There are 10 established radars, therefore cannot cover throughout Turkey.	x

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
10	**Flow Data and Flow Observation Stations**	Yes	Not Usable	Table	Updated	Shall be quantitatively arranged and coordinated and transferred to GIS environment	Medium
11	**Disaster Reports**	Yes	Not Usable	Table	Updated	Data shall be quantitatively arranged and coordinated and transferred to GIS environment.	Low
12	**TUAA**	Yes	Partly usable	Table	Not updated	Data shall be quantitatively arranged and coordinated. Disaster information on TUAA are updated until January 2012.	Low
13	**Sudden Flood Warning System**	No	Usable in the future	Quantitative	Under Preparation	General Directorate of Meteorology is establishing a Sudden Flood Warning System.	Medium
14	**Flood Prevention Plants Implementation Projects and Planned Projects**	Yes	Not Usable	Quantitative	Updated	Projects are in archives of DSİ, Municipalities, Governorates and District Governorates. Data shall be collected from archives, quantitatively arranged and transferred to GIS environment.	High
15	**Avalanche Data**	Yes	Not Usable	Document	Not updated	Data shall be arranged to determine usability.	High

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
16	**Avalanche Prevention Plants Implementation Projects**	Yes	Not Usable	Quantitative	Updated	No portal that displays collection of implementation projects. Project data shall be arranged and transferred to GIS environment	High
17	**OGM CAS Database and Afforestation, Soil Conservation and Watershed Amelioration Work Map**	Yes	Partly usable	Quantitative	Updated	Things to do map is transferred to the system by 50%. It shall be completed. 2 pilot study carried out in regional directorates of forestry in order to transfer Things to do map to the system.	Medium
18	**Pasture Information System**	Yes	Usable in the future	Quantitative	Updated	MERBİS to be completed by the end of 2012; 6 provinces remains un transferred. Apart from restrained and assigned pastures, updating of all border information for pastures is ongoing.	Low
19	**Management Plans**	Yes	Partly usable	Quantitative	Updated	The database for table datasheet of Management Plans are not correlated with GIS layers. Stand map and table data shall be correlated. OGM is working in that regard. Since there is no up-to-date Management Plan for Eastern and South Eastern Anatolia Regions, stand maps are not updated. By 2013, 57% of Management Plans will expire.	Medium

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
20	**KVK Information System and Cadastral Maps**	Yes	Partly usable	Quantitative	Not updated	KVK project is ongoing. Problems with data quality. Overlapping polygons. Topological arrangements shall be done and data shall be transferred to the system.	High
21	**Breeding Statistics**	Yes	Usable in the future	Quantitative	Updated	Detailed information on animal breeding statistics shall be available when MERBİS is completed by the end of 2012.	x
22	**Soil Maps**	Yes	Partly usable	Quantitative	Not updated	Soil Database shall be updated. Remaking a "Soil Database" with necessary budget will require a long time. Existing Database is available for current studies however is not adequate and misleading. Methods to transfer updated data feeding the existing studies shall be sought; analytic approaches (to assess updated data to the existing system shall be adopted intermediate proposals shall be developed).	High
23	**Soil Surveys**	Yes	Not Usable	Table	Updated	Sections and division layers shall be correlated and transferred to GIS environment.	Low
24	**Aridity Mps**	Yes	Usable	Quantitative	Updated	x	x

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
25	**Forest Cadastral Maps**	Yes	Partly usable	Quantitative	Not updated	7 million hectares of forest lands are registered. Remaining delimiting registration practices are ongoing. KADBİS system contains all registered forest lands.	High
26	**Silviculture Application Projects**	Yes	Not Usable	Table	Updated	Silviculture studies done on the basis of sections and divisions do not have Quantitative maps. Quantitative maps and schedules can be used by correlating in GIS environment.	Medium
27	**OGM Trial Lands**	Yes	Not Usable	Document	Updated	No Database concerning studies in test lands. Project data be quantitatively arranged and transferred to GIS environment.	Low
28	**Conserved Lands Database**	Yes	Usable	Quantitative	Updated	x	x
29	**e-license Database**	Yes	Usable	Quantitative	Updated	Available maps with spatial characteristics. There are overlapping polygons. Shall be corrected topologically.	Medium

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
30	**Proceedings, Fire Reports**	Yes	Not Usable	Document	Updated	Shall be arranged and coordinated as a table.	Medium
31	**Abiotic Conservation Proceedings and Damage Reports**	Yes	Not Usable	Document	Updated	Shall be arranged and coordinated as a table.	Medium
32	**Biotic Conservation Proceedings and Damage Reports**	Yes	Not Usable	Document	Updated	Shall be arranged and coordinated as a table.	Medium
33	**Forest Ecosystems Monitoring Project**	Yes	Partly usable	Quantitative	Updated	Level 2 requires detailed analysis; therefore cannot be continuously conducted for whole country.	Low
34	**Agriculture Statistics**	Yes	Not Usable	Quantitative	Updated	Data should be available by region, province, town and village. Data shall be rearranged based on watershed. Measurement units of GTHB and OSİB (da/ha) differs.	Low
35	**Agriculture Parcels Information System**	Yes	Usable in the future	Quantitative	Under Preparation	Agriculture Parcels Information System project is ongoing. Correlation of cultivated land with cadastral parcels is ongoing. Studies have begun in areas with identified characteristics.	Medium

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
36	**Consolidation Land Maps**	Yes	Usable	Quantitative	Updated	Available for the areas of practice for TRGM. Updated and Usable. Available in General Directorate of Agricultural Reform Quantitative Project Portal.	x
37	**Product Pattern Map**	Yes	Not Usable	Quantitative	Not updated	Project based studies. No database to cover throughout Turkey. Cannot be listed as a Data Source as project implementation covers small areas.	High
38	**National Registry of Farmers**	Yes	Usable in the future	Quantitative	Under Preparation	National Registry of Farmers will went online on January 2013.	Low
39	**Water Quality Measurement Data and Stations**	Yes	Not Usable	Table	Updated	DSİ measures certain parameters in water quality stations. Parameters are measured physically and chemically; but not biologically. Shall be quantitatively arranged and coordinated and transferred to GIS environment	Medium
40	**Sampling Spots**	Yes	Usable in the future	Quantitative	Under Preparation	Ongoing pilot studies on water quality and water contamination data as well as establishing water quality monitoring network in the scope of SÇD. Upon completion of the project, Turkey monitoring network will provide data.	High
41	**Watershed Conservation Action Plans**	Yes	Usable in the future	Quantitative	Under Preparation	Water quality data to be collected in the scope of watershed conservation action plans projects shall provide information on monitoring and control of the existing situation, erosion status, and underground and aboveground water contamination sources. Action plans are not completed for all watersheds.	Medium

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
42	**Air Quality Data and Measurement Stations**	Yes	Usable	Quantitative	Updated	x	x
43	**Environmental Statistics**	Yes	Usable	Quantitative	Updated	x	x
44	**Socio-economic parameters**	Yes	Usable	Quantitative	Updated	x	x
45	**Natural (Wild) Burning Area Records**	No	Not Usable	x	x	Data can be collected by remote sensing methods. (Terra Aster, Landsat TM/ETM+, Spot 5, Radar Images (Terra SAR X, RadarSAT) Hyperspectral images can be used.	High
46	**Potential Waste Lands Map**	No	Not Usable	x	x	Data can be collected by remote sensing methods. (Terra Aster, Landsat TM/ETM+, Spot 5, Radar Images (Terra SAR X, RadarSAT) Hyperspectral images can be used.	High
47	**Leakage Land Records**	No	Not Usable	x	x	Data can be collected by remote sensing methods. (Terra Aster, Landsat TM/ETM+, Spot 5, Radar Images (Terra SAR X, RadarSAT) Hyperspectral images can be used.	High
48	**DSİ Project Areas**	Yes	Usable	Quantitative	Updated	x	x

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
49	**Environmental Plan**	Yes	Partly usable	Quantitative	Updated	Environmental plans available for all provinces in Turkey except for Ankara and Kilis.	Medium
50	**Historical and Cultural Building Inventory**	Yes	Not Usable	Document	Updated	Historical and Cultural Building Inventory is not kept in the Database. Data is available by province in related directorate. Shall be quantitatively arranged and transferred to GIS environment.	High
51	**Land Monitoring System, Land Cover and Land Use Maps (CORINE)**	Yes	Usable	Quantitative	Updated	Land use maps are not in conformity with real use. Problems in assessment and quantifying of satellite images. Land use maps for 2012 will be prepared by using high resolution images in 2014. It is planned to use 80 sub classes and a resolution of Spot 5 m images for 1 ha area. It is planned to prepare land use map in 1/25.000 scale throughout Turkey.	x
52	**Wind Atlas**	Yes	Usable	Quantitative	Updated	x	x
53	**Wind Energy Potential Atlas**	Yes	Usable	Quantitative	Updated	x	x
54	**Geothermal Potential Maps**	Yes	Not Usable	Quantitative	Updated	Projct based data available. Shall be quantitatively arranged and transferred to GIS environment	Medium

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
55	**Solar Energy Potential Atlas**	Yes	Usable	Quantitative	Updated	x	x
56	**Nuclear and Radioactive Events Information Retrieval Platform Reports**	Yes	Not Usable	Document	Updated	Shall be quantitatively arranged and transferred to GIS environment	Medium
57	**Environmental Radioactive Readings**	Yes	Not Usable	Document	Updated	Shall be quantitatively arranged and transferred to GIS environment	Medium
58	**Thermal Power Plant Waste Gas On-site Readings**	Yes	Usable	Quantitative	Updated	Shall be arranged and transferred to GIS environment	Medium
59	**Water course and Lake Observation Stations**	Yes	Not Usable	Document	Updated	Shall be quantitatively arranged and transferred to GIS environment	Medium
60	**Chemical Drug and Manure Use Land Measurements**	Yes	Not Usable	Document	Updated	Available in different locations and shall be gathered in a single database. Shall be quantitatively arranged and transferred to GIS environment.	High
61	**Coast Line and Integrated Coastal zone**	Yes	Partly usable	Quantitative	Not updated	Coast Line and Integrated Coastal zone project is ongoing and completed by 80%.	Low

No	Data Source	Availability	Usability	Quantitative aspects	Up-to-datedness	Requirement	Operational Load
62	Noah's Ark National Biological Diversity Database	Yes	Usable	Quantitative	Updated	Updated, Usable. However, Biological Diversity data of equal quality cannot be produced for throughout Turkey.	x
63	DSİ Plant Information	Yes	Usable	Quantitative	Updated	x	x
64	Biological Diversity Monitoring Reports	Yes	Not Usable	Document	Updated	No monitoring reports covering all Turkey; merely regional studies are carried out. Shall be quantitatively arranged and transferred to GIS environment	Medium
65	Migratory Routes Map	No	Not Usable	x	x	x	High
66	Culture and Tourism Conservation and Improvement Regions	Yes	Not Usable	Quantitative	Updated	Culture and Tourism Conservation and Improvement Regions data neither available on GIS environment nor in a database. Project based data is available. CAD data shall be transferred to GIS layer structure.	Medium
67	Monthly Production Sales and Stock	Yes	Not Usable	Table	Updated	Records available on the level of regional directorate and chieftaincy. Records shall be rearranged on the basis of watersheds. Data shall be kept in excel format.	Medium
68	Biological Diversity and Non-wood Products Database	Yes	Usable	Quantitative	Updated	GPS inclusive cameras are used in site works and photos are transferred to the database with coordinates.	x
69	National Pasture Use and Management Database	Yes	Usable	Quantitative	Updated	x	Low

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