NATIONAL AND INTERNATIONAL PROJECTS CARRIED OUT BY THE TURKEY IN THE PROCESS OF ADAPTATION TO CLIMATE CHANGE AND LAND DEGRADATION NEUTRALITY

In the post-2020 period, the Paris Agreement aims to strengthen the global socio-economic durability against the threat of climate change. The most important consequence of the Paris Agreement is that the countries of the world must take precautions in their plans and programs to combat climate change. This will create a great transformation on its own.

Our country has signed the Paris Agreement with the representatives of 175 countries at the High Level Signing Ceremony in New York on 22 April 2016 and that in the National Declaration we have signed the Agreement as a developing country.

In September 2015, 15.3 of the Sustainable Development Goals adopted in New York (SKH 15.3);until 2030, it was accepted that the combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral World.

Land degradation is defined as the loss or decrease of biological and economic yield capacity and loss of the land. Land degradation is a global phenomenon that is often instantaneous, with devastating effects at the local level. Land degradation is usually caused by human activities and is accelerated by natural processes such as climate change. It is thought that about 25% of the total arable land area on the global scale has been destroyed. Each year, 12 million hectares are added to the total land area that has been devastated. The economic cost of land destruction is estimated at USD 490 billion annually. This amount corresponds to three percent to six percent of the gross national income from the agricultural sector worldwide.

Land Degradation Neutrality (LDN) provides a significant benefit in slowing and adapting climate change. Stopping and reversing land degradation increases carbon stocks in the soil and vegetation. In this regard, carbon is kept in the soil. At the same time, the LDN plays an essential role in strengthening resistance to climate shocks by the rural community by securing and developing vital ecosystem services.

In this context, the United Nations Convention to Combat Desertification (UNCCD) has included 15.3 of the Sustainable Development Goals into own roadmap.

At the UNCCD 12th Conference of the Parties held in Ankara on 12-23 October 2015, as a COP decision, the decision has been taken by the Parties to establish "National Voluntary LDN Targets". Within this scope, the "Land Degradation Neutrality (LDN) National Report (2016-2030)" was prepared by the General Directorate of Combating Desertification and Erosion with the cooperation of related institutions and organizations in the direction of the experienced experiences and 2030 LDN targets were determined. Within the scope of the targets, 1 million hectares of afforestation, 750,000 hectares of rangeland rehabilitation and 2,000,000 hectares of agriculture shall be rehabilitated until 2030. Also, 2.200.000 ha dry agricultural area is expected to be opened to irrigation.

Land Degradation Neutrality (LDN) is a very important tool in global struggle with desertification, climate change and drought. Also, land plays an important role both in adapting to climate change and in adaptation. 25% of the carbon emissions that cause climate change are due to land degradation. Successful and sustainable land management can reshape climate change scenarios. Benefits of LDN include; there are numerous environmental and social benefits such as food security, equal income distribution, poverty reduction and resource availability. It is also of considerable benefit in terms of slowing climate change and adapting to this change. In addition, it is among the benefits of the LDN to strengthen the resilience of the rural community to climate shocks by securing and developing ecosystem services. Turkey holds many national and international projects for Land Degradation Neutrality and climate change adaptation and adjustment process.

In addition, national projects (National land cover / use classification and monitoring system project, Monitoring of Turkey's land productivity (collect earth method), soil organic carbon project) are being made within the scope of Land Cover, Land Efficacy and Soil Organic Carbon, which are considered as indicators of LDN and the National LDN report is updated in the framework of the recorded developments.

Turkey’s Soil Organic Carbon Model and Mapping 2017-2019; The Twelfth Conference of Parties to the UNCCD and the United Nations Sustainable Development Goals target 15.3 requires determination of the amount, monitoring, and accurate mapping of soil organic carbon in Turkey. Within the scope of the Turkey Soil Organic Carbon Model and Mapping Project, which will serve to determine the amount of and to monitor soil organic carbon, a Land Degradation Neutrality criterion, various meetings and workshops were organized to

obtain expert opinions from TUBITAK and other institutions, and literature review was carried out. The comprehensive and wide-range project required co-operation with various institutions. To this end, a protocol was signed by the General Directorate of Combating Desertification and Erosion (ÇEM), General Directorate of Agricultural Research and Policies (TAGEM), General Directorate of Forestry, and the General Directorate of State Hydraulic Works (DSI), for the collection of analysis results of soil samples collected for various reasons. For this purpose, a cooperative project was initiated with TUBİTAK to determine the current status in order to identify the soil organic carbon amount in Turkey, to create a model to determine the soil organic carbon amount, and to develop a monitoring system.

The National Land Cover / Use Classification and Monitoring System (UASIS) project has started in 2017. It is essential to distribute the project work load to share knowledge in order to ensure the immediate submission and verification of data on the system by field officers across country, and to provide quick response to system errors. To this end, a crowdsourcing system utilizing the knowledge of institution personnel to create accurate and up-to-date data would prove beneficial regarding cost reduction and the efficient use of resources.

Monitoring of Land Cover and Vegetation Cover Change Trend Project

Using the Google database, changes in land cover and the tendency of greening monitoring works have been made in different regions. A new open source software has been developed with the help of satellite technology to track changes in the field covered in any area. This new software was developed using the Google database, which has been available from 1984 to until today.

1. Level monitoring (2015), the monitoring was conducted in 3950 Total points in Turkey and 15.000 points in 13 Middle East countries.

2. Level monitoring (2016-2017), all in Turkey, 61 685 point evaluation studies have been performed.

National and international projects to be executed by Turkey;

The Contracting Parties to the United Nations Convention to Combat Desertification are obliged to prepare **National Action Plans**. Formulated in order to ensure more effective combat against desertification, to establish inter-institutional coordination, to abide by the Convention requirements, and to regularly monitor activities, the “National Strategy and

Action Plan to Combat Desertification" is being prepared. Within this scope, National Strategy and Action Plan to Combat Desertification Progress Report of 2016 was authored in 2017.

General Directorate and Combating Desertification and Erosion initiated the **"Turkey Desertification Model Verification and Calibration Project"** in co-operation with TUBITAK, and launched in 2016 pilot site projects in Aksaray and Mersin provinces. Following works was held in Çorum, Amasya, Samsun provinces and also Şanlıurfa and Adıyaman provinces in 2017. Calibration and validation works will be maintained until whole Turkey is covered. In addition, the Desertification Model is envisioned to be transformed into a regional project covering Middle Asian, African and Mediterranean countries.

Integrated Natural Resources Management Project in Drought-Prone and Salt-Affected Agricultural Landscapes in Central Asia and Turkey (CACILM II) covers trans-boundary drought and desertification threat in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan prompted a multi-country approach in 2003, with the Sub-regional Action Programme for Central Asian Countries on Combating Desertification and Drought introducing and implementing the 10-year-long international "Central Asian Countries Initiative for Land Management (CACILM-I)" project. Activities within the project included multicounty partnerships and information exchanges, legislative framework enhancements, numerous field applications, and mainstreaming of best practices.

Evaluation of Land Degradation and Dissemination of Support for Sustainable Land Management and Good Practices Project (DS-SLM) will be initiated as of 2017 within the scope of UNCCD-FAO joint project. This project will be implemented between 2018-2020. Carried out on a global level, with Turkey, Bosnia and Herzegovina, Argentina, Bangladesh, China, Colombia, Ecuador, Lesotho, Morocco, Nigeria, Panama, the Philippines, Thailand, Tunisia and Uzbekistan as project partners, the project will benefit from GEF-5 resources over its period of 48 months. The vision is to assess land degradation, capacity building on reporting, and mainstreaming sustainable land management in combat against land degradation in country parties to the United Nations Convention to Combat Desertification. The General Directorate of Combating Desertification and Erosion is coordinating the project on behalf of Turkey, and is cooperating, due to the scope of authorities, with the General Directorate of Forestry and Water Affairs, Ministry of Food, Agriculture and Livestock (General Directorate of Agricultural Reform – General Directorate of Agricultural Research and Policies)

and the Soil Science Society of Turkey. Within the scope of project, 2 experts have attend the WOCAT training 7-12 August 2017 in Uzbekistan.

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Sustainable Land Management and Climate-Friendly Agriculture Project; is implemented in Konya Closed Basin. It aims to improve the management of agricultural lands, pastures and forests in Turkey through the adoption of low-carbon technologies in view of sustainable land management, biodiversity conservation and adaptation to climate change. Project implementation was initiated in January 2015, and is expected to be completed in December 2018.

Murat River Watershed Rehabilitation Project aims to reduce poverty among the upland communities of the Murat river watershed. The corresponding verifiable indicator established for the goal is Reduction in the number of village households living below the national poverty line by 10%" in the target areas of Elazığ, Bingöl and Muş. Within this scope, Annual Monitoring Survey was conducted; Integrated Watershed Rehabilitation Projects prepared; Monitoring and Evaluation Software was developed; Mid-Term Evaluation Mission was conducted.

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Dynamic Erosion Model and Monitoring System (DEMIS); The soil transportation into rivers in Turkey were mapped with the RUSLE (Revised Universal Soil Loss Equation) model. The Dynamic Erosion Model and Monitoring System (DEMIS) was developed to attribute a dynamic structure to this model, as well as to provide long-term Monitoring and reporting. The system allows for the temporal, spatial, and areal monitoring of the impacts the kinetic energy of precipitations, changes in the land cover, and the soil-water conservation activities have on erosion intensity fluctuations. The Dynamic Erosion Model and Monitoring System (DEMIS) digitalizes erosions as “potential”, “real” and “reaching rivers” based on annual average soil loss. The system has also updated the Rainfall Erosivity Factor (R) and the Vegetation Cover and Management Factor (C). Soil Erodibility Factor (K) and the Sediment Delivery Ratio (SDR) will be updated.

Also, **National Dynamic Wind Erosion Model and Monitoring System (UDREMIS**) was developed in 2017. The wind erosion risk map will identify the risky areas in our country. For this purpose, the areas subject to wind erosion at the national scale and having wind erosion potential were determined according to ‘wind erosion climate factor’. In this context, wind erosion is monitored and risk assessment is carried out in pilot projects in pastureland and agricultural areas which are under threat of wind erosion and in areas where wind erosion prevention work is done. The measurements are carried out with sediment trap sets placed into parcels containing different land uses. The outcomes of the measurements will be used to identify wind erosion control methods.

Furthermore, as the General Directorate; Erosion Control and Afforestation Projects, Watershed Rehabilitation Projects, Upper Watershed Flood Control Projects, Afforestation Projects for Agricultural Lands, Avalanche Risk Mapping Projects, Landslide Control Projects, Landslide Risk Mapping Projects, and Mine Site Rehabilitation Projects were carried out.