



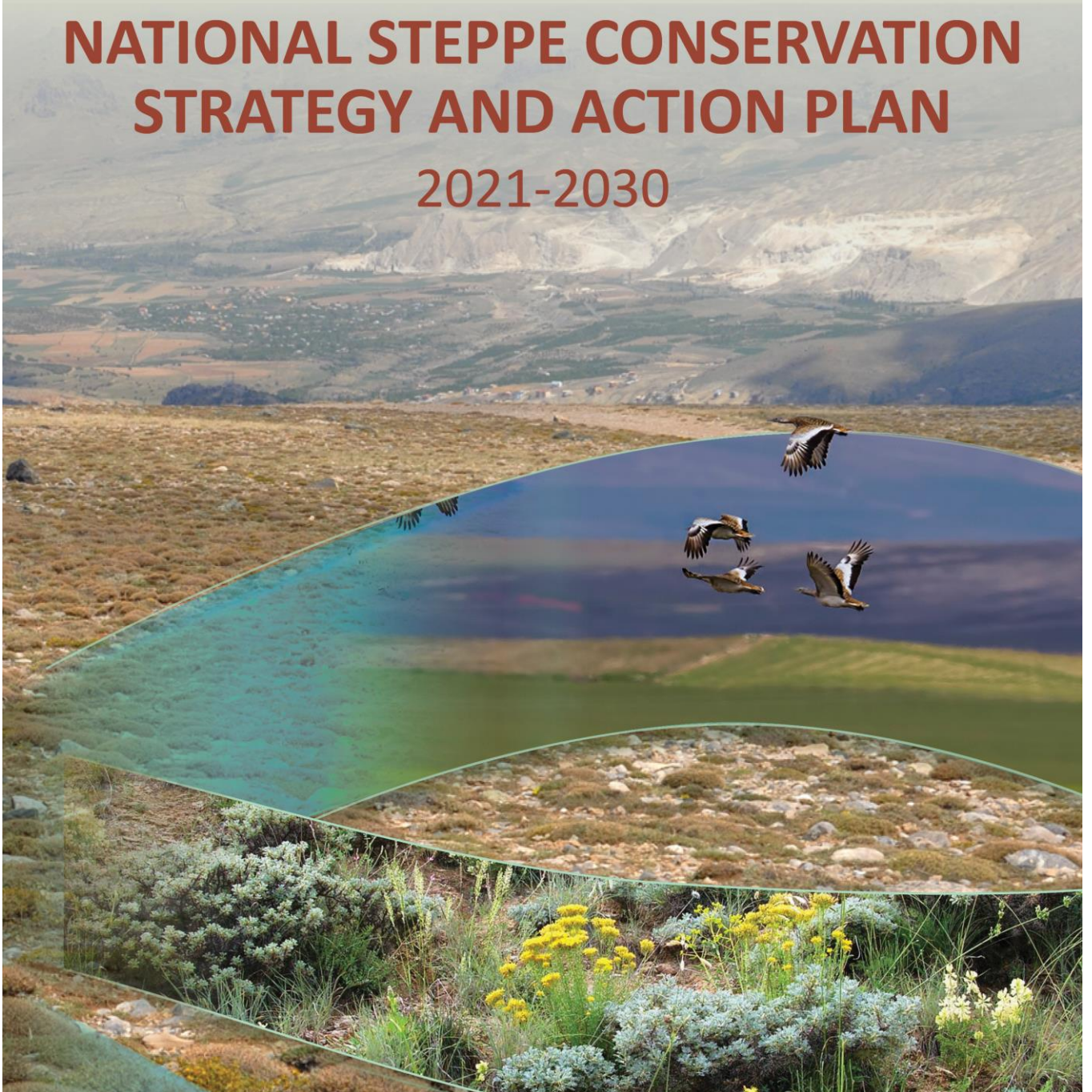
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Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project

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NATIONAL STEPPE CONSERVATION STRATEGY AND ACTION PLAN 2021-2030



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Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project

National Steppe Conservation Strategy and Action Plan

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Abbreviations

AARI	Aegean Agricultural Research Institute
ARDSI	Agriculture and Rural Development Support Institution
BERN	Convention on the Conservation of European Wildlife and Natural Habitats
CAE	Chamber of Agricultural Engineers
CBD	Convention on Biological Diversity
CORINE	Coordination of Information on the Environment
CR	IUCN Red List Categories “Critically Endangered”
DAP	Eastern Anatolia Project - Doğu Anadolu Projesi
DD	IUCN Red List Categories “Data Deficient”
DKM	Nature Conservation Centre – Doğa Koruma Merkezi
DOKAP	Eastern Black Sea Project - Doğu Karadeniz Projesi
DSD	Directorate of Strategy Development
DTP	Department of Training and Publication
EBA	Ecosystem Based Adaptation
EBALP	Environmentally Based Agricultural Land Protection Program
EIA	Environmental Impact Assessment
EVI	Enhanced Vegetation Index
GAP	South-Eastern Anatolia Project - Güneydoğu Anadolu Projesi
GDAE	General Directorate of Agricultural Enterprises
GDAR	General Directorate of Agricultural Reform
GDARP	General Directorate of Agricultural Researches and Policies
GDCDE	General Directorate of Combating Desertification and Erosion
GDDA	General Directorate for Development Agencies
GDEUER	General Directorate for European Union and External Relations
GDEM	General Directorate for Environmental Management
GDF	General Directorate of Forestry
GDFC	General Directorate of Food and Control
GDH	General Directorate for Highways
GDL	General Directorate of Livestock
GDM	General Directorate of Meteorology
GDNCNP	General Directorate of Nature Conservation and National Parks
GDPNH	General Directorate for Preservation of Natural Heritage
GDPP	General Directorate of Plant Production
GDSHW	General Directorate for State Hydraulic Works

GDSP	General Directorate of Spatial Planning
GDWM	General Directorate for Water Management
GEF	Global Environment Facility
GSP	Global Soil Partnership
FAO	Food and Agriculture Organization of the United Nations
IBA	Important Bird Area
IPA	Important Plant Area
IPARD	Instrument for Pre-Accession Assistance for Rural Development
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IT PGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
KOP	Konya Plains Project - Konya Ovası Projesi
LRAIS	Land Registry Archive Information System
MAF	Ministry of Agriculture and Forestry
MEU	Ministry of Environment and Urbanization
MNE	Ministry of National Education
NatP	Natural Park
NBSAP	National Biodiversity Strategy and Action Plan
NE	IUCN Red List Categories “Not Evaluated”
NDVI	Normalized Difference Vegetation Index
NGO	Non-Governmental Organization
NM	Natural Monument
NCCAP	Turkey’s National Climate Change Action Plan
NCCASAP	Turkey's National Climate Change Adaptation Strategy and Action Plan
NOAA	National Oceanic and Atmospheric Administration
NP	National Park
NRA	Nature Reserve Area
NSAPCD	National Strategy and Action Plan for Combating Desertification
NT	IUCN Red List Categories “Near Threatened”
PBA	Prime Butterfly Area
RAMSAR	Convention on Wetlands of International Importance especially as Waterfowl Habitat
RIS	Rangeland Information System
SCP	Systematic Conservation Planning

SDGs	Sustainable Development Goals
SEPA	Special Environmental Protection Area
SPN	Society for the Protection of Nature
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TSR	Turkish State Railways
TUBITAK	Scientific and Technological Research Council of Turkey - Türkiye Bilimsel ve Teknolojik Araştırma Kurumu
TURKSTAT	Turkish Statistical Institute
UN	Unites States
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WR	Wildlife Reserve

Preface

Anatolia is one of the regions of global importance in terms of biodiversity and the traditional knowledge on biodiversity it bears. It is a place where various land use activities dating back to the oldest agricultural practices in the world are carried out and where various civilizations have lived. The steppes are very important and vulnerable areas in this geography in terms of biodiversity and genetic resources richness. At present, there are large, species-rich, partially natural but generally semi-natural steppe areas in the inland of Anatolia. These steppe areas are ecosystems that are extremely rich in biodiversity and serve as a very important insurance for the conservation of natural values and food security of humanity. They are important shelter for the wild relatives of many cultivated species today and an extremely important habitat for many bird, butterfly, mammal and reptile species. In other words, the steppes are an important gene center and the food security of the future.

“The Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project” in progress with the aims of mainstreaming the conservation of Turkey's steppe biodiversity in production landscapes and strengthening the conservation of steppe ecosystems is important to highlight the importance given to the steppes.

The project is carried out by the Food and Agriculture Organization of the United Nations (FAO) and the Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks (GDNCNP), General Directorate of Plant Production (GDPP), and General Directorate of Forestry (GDF) with the financial support of the Global Environment Facility (GEF).

This project and the National Steppe Conservation Strategy show the importance that FAO and the Ministry of Agriculture and Forestry have given to the conservation of Turkey's rich and vulnerable steppe ecosystems, their sustainable and cooperative management and raising awareness.

This strategy is noteworthy in terms of contributing to the conservation of unique steppe values owned by Turkey at national level as well as to the fulfillment of international commitments such as International Convention on Biological Diversity, Aichi Goals of Convention on Biological Diversity and Convention to Combat Desertification. It appears that there are hardly any policy or legal documents directly oriented towards steppe ecosystems, whereas the legal and administrative bases for the conservation and management of mountain-forest, wetlands, coastal and marine ecosystems are available in Turkey. Therefore, the National Steppe Conservation Strategy and Action Plan is of special importance.

We would like to present our endless thanks to the Ministry of Agriculture and Forestry, General Directorate of Nature Conservation and National Parks, the General Directorate of Plant Production and the General Directorate of Forestry and the provincial units that host steppe ecosystems, especially the Şanlıurfa units, which has implemented a steppe project aiming at conservation of and strengthening sustainable management of Turkey's steppe ecosystems by considering the necessity of a national steppe conservation strategy, and the representatives of all institutions and organizations that support the process, as well as to the Food and Agriculture Organization of the United Nations (FAO) and Nature Conservation Centre (DKM) teams. The Ministry of Agriculture and Forestry and FAO have exhibited an admirable example of cooperation with all relevant parties in process of the project implementation and strategy preparation. In particular, despite the COVID-19 epidemic that has affected the whole world, continuation of the works has been ensured and the process has been continued with various alternative tools. We would like to present our endless and sincere thanks to all participants who contributed and supported this process.

Strategies and activities taking into account all sectors directly or indirectly involved in the conservation and management of steppe biodiversity and values makes up the basis of this strategy, which includes approaches and actions regarding the conservation of steppe biodiversity and its management in cooperation with all relevant stakeholders, and it is based on the fulfillment of the commitments from international conventions and the National Biological Diversity Strategy Action Plan and the National Strategy for Combating Desertification. Therefore, realizing the importance of the ecosystem value of the steppes of Turkey and being aware of their importance, we wish that this strategy aids in the conservation of Turkey's natural assets and values, and their sustainable management.

**The Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project
National Project Coordinator, on behalf of the Project Team**

Executive Summary

Steppes of Turkey, which are generally distributed in the Eastern, Southeastern and Central Anatolian Regions, are one of the most important and most sensitive ecosystems of Turkey's natural landscape. Within the Irano-Turanian phytogeography, Turkey steppes, of all natural ecosystems, are the most threatened ecosystems due to human activities. One of these threats is the destruction and irreversible loss of steppe habitats. With the increase in mechanization in agricultural activities, the destruction in all steppes, mainly the lowland steppes, is increasing. Additionally, steppe areas are lost due to investments, mining activities, energy investments, afforestation practices in unsuitable areas and urbanization pressure. One of the important factors destroying the natural vegetation cover of the steppes is overgrazing. Today, the steppes continue their existence in stony or rocky areas as islets that contain the remains of natural vegetation between agricultural fields and grazing lands. Other factors that threaten steppe ecosystems and the species that they host include illegal hunting and poaching, illegal collection of plants and intensive agricultural activities. The lack of awareness about the importance of steppe species in Turkey, and conservation efforts for these species being limited to protected areas are two other factors that negatively affect the biodiversity of steppes. To mitigate these threats, works on the conservation and sustainable management of the steppes are becoming more and more crucial.

Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project is the leading project in progress with the aims of mainstreaming the conservation of Turkey's steppe biodiversity in production landscapes and strengthening the conservation of steppe ecosystems. One of the important works within the scope of enabling environment established for the effective conservation of steppe biodiversity across large landscapes is the participatory preparation of a national-scale conservation strategy and action plan for steppes.

Steppe is a formation of mostly xerophytic species, which dry out in summer and go dormant in winter, dominated by annual or perennial Poaceae and other herbaceous species and perennial cushion-forming shrubs. The word “steppe”, which is “bozkır” in Turkish, is a Russian word for the pastures in the south of Eastern Europe and it entered Turkish from there. The steppes are among the main biogeographical groups in the world within the grasslands. The grasslands and steppes that cover 40% of the world, except Antarctica and Greenland, are among the most important ecosystems for the maintenance of life. **The Steppe Vegetation** section of the strategy and action plan provides an overview of the distribution and classification of steppes in the world. This section also includes detailed evaluations of the distribution of steppes across the country by the Nature Conservation Centre. In this context,

it is revealed that the potential zone of steppe and forest-steppe ecosystems in Turkey (areas that form sparse or closed forests, within the ecological regions dominated by steppes) cover an area of approximately 33.5 million hectares. According to the analyses, there are approximately 17 million ha of steppe area and 552,334 ha of forest-steppe within the potential steppe zone. The plant diversity of the steppe areas constitutes an important part of the floristic richness of Anatolia. They are also extremely important habitats for many steppic bird, insect, mammal, amphibian, and reptile species.

The Anatolian steppes have been the center of civilizations throughout history. Before the settled life, the foundations of belief centers such as Göbeklitepe were laid in upper Mesopotamia. Likewise, Anatolia is the center of agriculture and transition to settled life. It has become the “Gene Centre” of agricultural and forage crops, such as lentils (*Lens* spp.), chickpeas (*Cicer* spp.), vetches (*Vicia* spp.), along with wheat (*Triticum* spp.) and barley (*Hordeum* spp.) species. Steppes have undertaken many ecological functions such as creating genetic reserves with the biodiversity they contain and serving as insurance for cultivated plants. In addition, they are extremely important ecosystems in terms of the development of animal husbandry, preservation of soil and water and erosion control. **The Steppes of Turkey** section of the strategy and action plan provides information, analysis, and assessments regarding the distribution of the steppes of Turkey, different approaches used in the classification of steppes, floristic characteristics, plant and animal diversity of Turkey steppes, interactions between people and steppes throughout the history of Anatolia, the use and the state of the rangelands in Turkey.

In Turkey, there is no definition for steppes in the legislation contrary to forests and wetlands. On the other hand, the steppe ecosystems of Turkey comprise natural steppes, meadows, rangelands and degraded forests of steppic nature and there are supporting elements associated with the conservation and sustainable management of steppes in many policy documents and legislation. Although there is no single institutional structure responsible for the conservation and management of the steppes, there is the capacity and various mechanisms within different institutions. **The Legal Framework and Institutional Structure Related to Steppes** section of the strategy and action plan portrays the current situation regarding the policies, legislation and mechanisms associated with the conservation and sustainable management of the steppes, particularly the institutional structure and capacity at the national level.

Of the steppes of Turkey (about 17.5 million ha), 42% is in Central Anatolia, 36% is in Eastern Anatolia, 14% is in Southeastern Anatolia, 5% is in the Black Sea region, 2% is in the Mediterranean region and 1% is in the Aegean Region. In the potential steppe and steppe

forest zone of Turkey, there are 75 protected areas of legal status and approximately 4% of 33.5 million hectares is under protection. However, of steppe and steppe forests (about 17.5 million ha) within the potential steppe zone, 2.9% is legally protected. **The Spatial Assessments Regarding the Steppes of Turkey** section of the strategy and action plan presents spatial assessments on the present situation with respect to conservation of steppes specifically in protected areas and important biodiversity areas, with attention to the distribution of steppes and steppe forests related to geographical regions and provinces; and threats to and pressures on the steppes of Turkey.

A conservation strategy and action plan adopted by all parties for the conservation and sustainable management of steppes of Turkey is of great importance. The overall aim of the National Steppe Conservation Strategy is to ensure the sociological ecological and economic sustainability of the steppes of Turkey. In accordance with this overall aim, 4 strategic goals and, under these, 12 strategic objectives have been identified taking into account policies, legislation, and mechanisms related to the steppes in line with the present situation of the steppes of Turkey and spatial assessments of the steppes. The first of these strategic goals is to create a cooperative environment and develop policies to ensure the effective management of the steppes. The second and third strategic goals are to protect the steppe biodiversity and to improve the use of resources in the steppes within the framework of the sustainability principle. The fourth strategic goal is to improve the livelihoods of the local people who benefit from the steppes. **National Steppe Conservation Strategy** and **National Steppe Conservation Action Plan** sections present the strategic goals and objectives for the conservation of the steppe and an action plan to achieve these goals and objectives. The action plan includes the short, medium, and long-term activities defined in the 2021-2030 period in order to achieve the goals and objectives in the strategy.

Defining a governance mechanism and monitoring system for the effective implementation, monitoring, and evaluation of the National Steppe Conservation Strategy and Action Plan is one of the most essential requirements. The issue of governance and cooperation gains more importance as steppe conservation and management works are carried out by different institutions. It is recommended that the main coordination of a National Steppe Conservation Strategy and Action Plan be made by the National Biodiversity Coordination Board in order to ensure coordination and cooperation between governmental organizations and stakeholders. Secretariat services of the National Coordination Board are undertaken by the General Directorate of Nature Conservation and National Parks. Under the National Coordination Board, a Sub-Committee on the Execution of the Contract on the National Basis, whose duties include the implementation of the National Biodiversity Strategy and Action Plan, will be the main board responsible for coordination of Steppe Conservation Strategy and Action Plan. The



Governance Model and **Monitoring System** sections of the strategy and action plan provide the framework for the key approaches, necessary structure and functioning in the subjects of implementation, supervision, and monitoring of the strategy in cooperation and coordination.

National Steppe Conservation Strategy and Action Plan leads the conservation and sustainable management of steppes at the national level with effective governance and cooperation. In addition, it also contributes to the fulfillment of international commitments such as the Aichi Biodiversity Targets of the Convention on Biological Diversity, the United Nations Convention to Combat Desertification and Sustainable Development Goals.

About the Project

Steppes are one of Turkey's most important ecosystems ecologically, economically and socially. Turkey's steppe ecosystems include pastures, meadows, and rangelands and cover approximately 33.5 million hectares of the country. Steppe ecosystems are prevalent in the Eastern, Southeastern and Central Anatolia Regions as well as the high mountains in the Aegean and Mediterranean Regions. Turkey's steppe ecosystems are faced with loss and destruction of habitat, excessive use of production areas and climate change threats.

In this context, one of the important projects implemented in Turkey is the Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project (GCP/TUR/061/GFF) lead by the Food and Agriculture Organization of the United Nations (FAO) and the Ministry of Agriculture and Forestry (MoAF) General Directorate of Nature Conservation and National Parks (GDNCNP), General Directorate of Plant Production (GDPP), and General Directorate of Forestry (GDF), with the financial support of the Global Environment Facility (GEF). The project aims to improve the conservation of Turkey's steppe ecosystems through effective management of protected areas and mainstreaming steppe biodiversity conservation into production landscapes. The components of the project, which is implemented in three different sites in Şanlıurfa consists of

- 1) Effectiveness of protected area system increased to conserve steppe biodiversity
- 2) Steppe biodiversity conservation mainstreamed into production landscapes
- 3) Enabling environment established for the effective conservation of steppe biodiversity across large landscapes.

Nature Conservation Centre (DKM; Doğa Koruma Merkezi) is responsible for the fulfillment of the 3rd component; "enabling environment established for the effective conservation of steppe biodiversity across large landscapes".

Within the scope of establishing enabling environment for the effective conservation of steppe biodiversity across large landscapes, one of the implemented tasks is the preparation of a conservation strategy and action plan at the national scale, in a participative way. Preparatory work started in 2019 to develop the strategy and action plan. During this process, an approach emphasizing participation was adopted and applied. The first meetings in this context were held face-to-face, but various meetings and workshops, which were planned to be held face-to-face were implemented in the digital environment as alternative activities due to the Covid-19 epidemic, and the flow of information was maintained in a healthy manner. It

has been ensured that all relevant institutions and organizations participate in the process in a participatory and effective manner.

In this context, 2 face-to-face workshop and meetings and 2 online meetings were held, and views were exchanged with experts from all relevant governmental organizations, academia, local schools, private sector and civil society. Members of the Project's National Steppe Conservation Working Group and Scientific Advisory Group also contributed to this process. In this context, 225 experts, including the authors of the strategy, contributed to the process. Of the contributing experts, 156 were from public institutions (69%), 32 were academics (14%), 26 were from NGOs (12%), 10 from international organizations (4%) and 1 was from the private sector (1%). Also, the ratio of women and men who contributed to the studies was 72% male and 28% female. Most of the experts who contributed to the process were from Ankara (40%) and Şanlıurfa (38%), the remaining from other 27 provinces: Adana, Adıyaman, Afyon, Aksaray, Antalya, Burdur, Çankırı, Diyarbakır, Düzce, Erzurum, Gaziantep, İstanbul, Karaman, Kars, Kayseri, Kilis, Kırşehir, Konya, Malatya, Mardin, Muş, Ordu, Osmaniye, Samsun, Sivas, Şırnak and Van.

In addition, an online questionnaire for collection of information, which provides a wider and more effective participation opportunity, was prepared as an alternative to face-to-face meetings in order to obtain the knowledge and contributions of experts of different institutions and organizations, and the questionnaire was distributed to relevant institutions and persons through FAO and the Ministry of Agriculture and Forestry. 399 experts from national and local public institutions, central and provincial organizations, academia, NGOs, and international organizations contributed to this survey. With this questionnaire, experts' evaluations and suggestions related to (i) threats, (ii) conservation proposals and (iii) situation assessments (SWOT Analysis) sections of the strategy and action plan were collected. In line with the results of the survey, the threats against the steppes on a national scale, conservation, and situation assessment were approved by the participants and finalized. At the same time, a regional-scale assessment of the threats to the steppes and the conservation proposals was made. These evaluations and recommendations have been integrated into the National Steppe Conservation Strategy and Action Plan. Finally, the framework of Steppe Terminology was prepared by Nature Conservation Centre experts with the aim of creating a terminology specific to the steppes as a part of the strategy. The framework steppe terminology study was delivered to the volunteer experts (30) in the Independent Consultants Group, FAO and MoAF Project team (20) using online tools, and the contributions and opinions of these experts were received. In the process, a Glossary for Steppes consisting of 42 terms was created and included as an important part of the strategy. This document is the Şanlıurfa Steppe Conservation Strategy and Action Plan, prepared in line with the support and opinions



of many different stakeholder groups as a result of nearly a year-long intense effort and contributions.

1. The Steppe Vegetation

Steppes can be defined as natural areas dominated by xerophytic herbaceous and woody plants. Steppe is a formation of mostly xerophytic species, which dry out in summer and go dormant in winter, dominated by annual or perennial Poaceae and other herbaceous species and perennial cushion-forming shrubs. The term “steppe”, which is “bozkır” in Turkish, is a Russian word for the pastures in the south of Eastern Europe and it entered Turkish from there. In North America, the equivalent of steppe vegetation is “prairie”. In addition, the steppes in South America are called “pampas” (Ketenoğlu et al., 2014).

In the steppes, trees can also be seen, but these are either very old trees that are residual or drought-tolerant small trees. The main reason why the steppes are dominated with annual or perennial herbaceous plants and there are a few trees is the low precipitation ratio. If the precipitation in an area falls below 500-600 mm per year, there are not many trees around. Of course, precipitation is not the only reason why there are herbaceous plants instead of trees. Diverse climatic events, recurrent natural fires, avalanches or floods, and sometimes the soil and bedrock structure can also be the cause. Nevertheless, the common feature of the vast steppes from one end of Europe to the east of China is low precipitation ratio.

1.1. Steppes in the World

Steppes are included in the grasslands in the main biogeographic groups in the world. Grasslands are also divided into two groups according to their region (

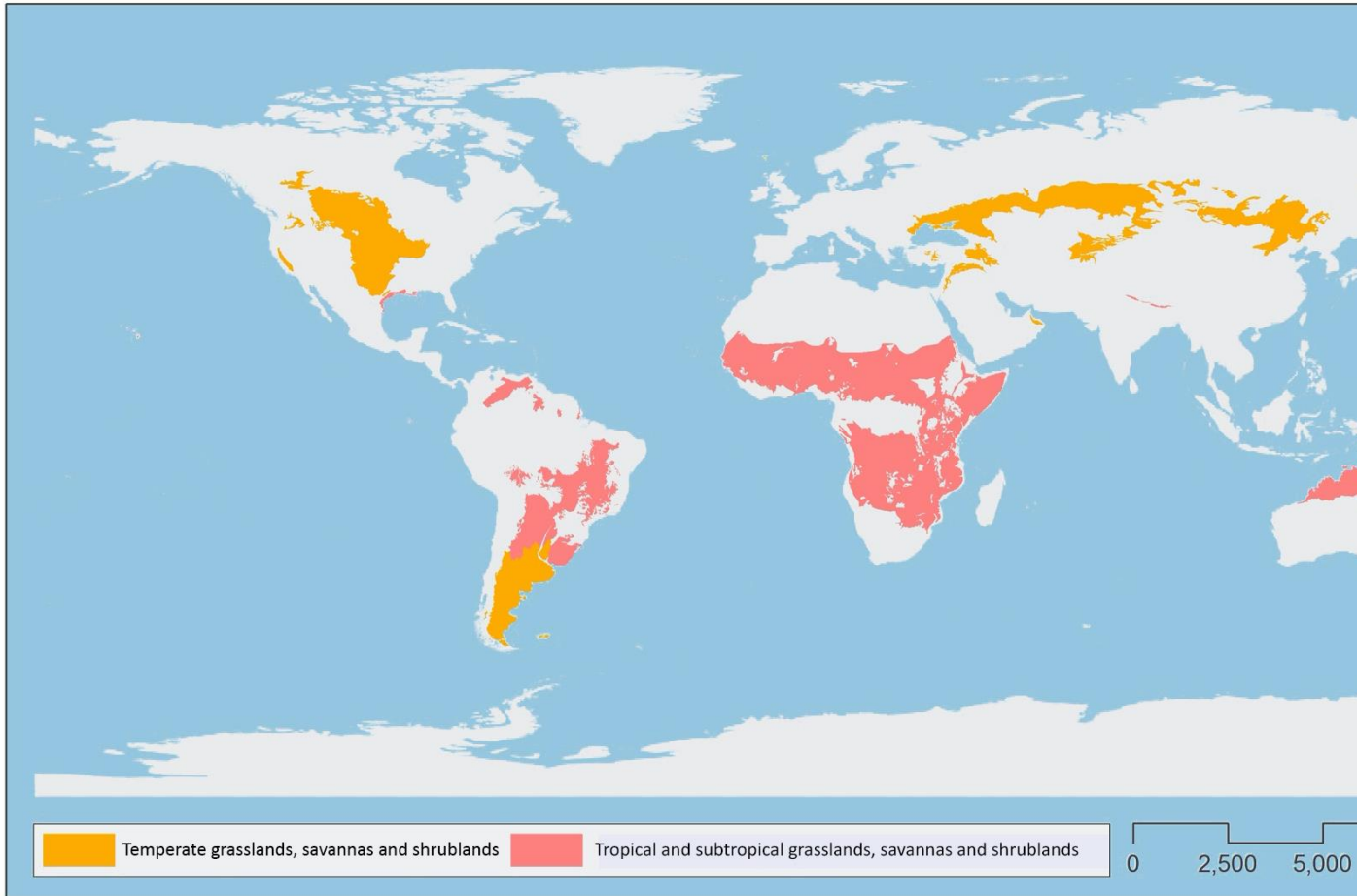


Figure 1; Olson et al., 2001):

1. **Tropical grasslands:** These areas are warm whole year, with no cold winters. It has two different seasons, namely, dry and rainy. The savanna ecosystems in Africa can be an example to this group. In these savannas live the world's most remarkable species such as elephants, giraffes, rhinoceroses, zebras, lions, cheetahs and hyenas.
2. **Temperate grasslands:** These areas are dominated by shorter grasses with approximately 250-600 mm of precipitation per year. For example, Ankara is in this group with 400 mm of precipitation. There are two separate periods in temperate grasslands, namely: dormancy and growth. During the dormant period, plant growth stops due to cold. In this group including the steppes, there are very few remarkable animals living in the savannas. Animals such as gazelles, wild sheep, wolves and jackals can be found.

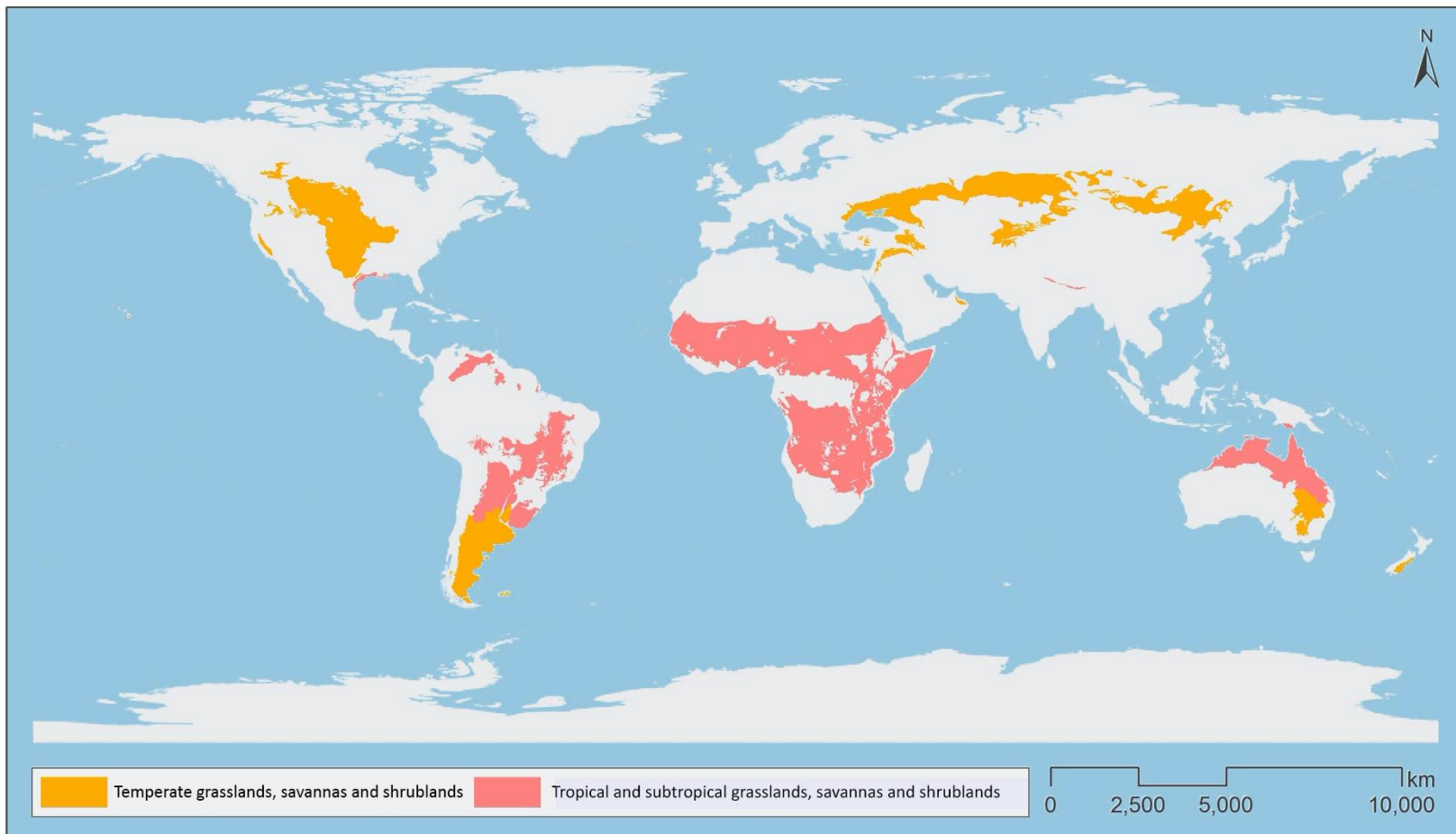


Figure 1. Tropical and temperate grasslands in the world ©DKM

Steppes are generally considered to be insignificant because of their monotonous appearance. However, the meadows and steppes covering 40% of the world, except Antarctica and Greenland, are among the most important ecosystems for the continuation of life:

- The main food sources such as wheat, barley and oats, which are consumed throughout the world, are grown in the steppes.
- Animal husbandry is largely based on steppes. Approximately 1 billion people living below the poverty level make their living from sheep breeding and cattle-raising. As much as 27% of milk production and 23% of meat production are met from the steppes.
- 33% of the carbon in the earth is stored in the steppes.
- Steppes are the most important ecosystem type in terms of herbivorous mammals, butterflies and plants.

Similarly, in Turkey, the ecosystems, which has the highest plant species richness and that hosts the plant species that are found nowhere else in the world, i.e., the endemics, are the steppes. Although the common belief is that forests, maquis shrublands and wetlands are richer, almost 80% of endemic plant species in Turkey are distributed in steppe areas. Contrary to popular belief, the steppes contain various plant species.

2. The Steppes of Turkey

Steppes are arid ecosystems, dominated by grasses, where trees and shrubs are rare, and precipitation is low. The steppes in Turkey are the dominant vegetation in the Southeast, East and Central Anatolia Regions. All steppes of Turkey are in the Irano-Turanian phytogeography. There are 35 phytogeographical regions in the world (Takhtajan, 1986). The Irano-Turanian phytogeographical region extends from the Central Asian steppes in the east to the Inner Aegean in the west; the northern part of Syria, the parts of Iran other than the Caspian coast, the South Russian deserts, Karakorum, Mongolia and Tibet Plateau are within this phytogeographical region. Takhtajan (1986), has divided Turkey steppes into Central Anatolia, Eastern Anatolia-Iran and Mesopotamia states.

The steppes of the Holarctic phytogeographical region, which is colder in nature are located in the south of Eastern Europe, Ukraine and Russia. The word “steppe”, which is “bozkır” in Turkish, is originally Russian.

The steppes of Turkey are defined as steppes of anthropogenic character commonly, in other words, it is regarded to have emerged as a result of the destruction of forest cover by human activities (Louis, 1939; Walter, 1956; Ketenoğlu et al., 2014). The steppes in the Salt Lake Basin and the Southeastern Anatolian plain are regarded as steppes of non-anthropogenic character. However, according to the studies of Schiechl et al. (1965), Mayer and Aksoy (1986) and Çolak and Rotherman (2006), steppes of non-anthropogenic character should include the inner parts of Thrace, a larger area around the Salt Lake Basin, the Malatya Plain, the Iğdır Plain and the Bulanık Plain.

The period when the steppes began to undergo a great change under human influence is thought to be around 3000 BC. In addition to the destruction for agriculture, animal husbandry, shelter and settlement, it can be assumed that the great wars in Anatolia played an important role in this destruction. Strabon suggests that the wars of the Hittites (2000-1200 BC), the wars between the Persians and the Greeks, the invasion of Anatolia by the Romans had an important role in the transformation of the vegetation of Central Anatolia into the steppe (63/64 BC – 24 AD). According to Strabo, Roman commanders burned a lot of forests while occupying Anatolia. According to Herodotus, the passage of Xerxes II with his army of 1 million people through Anatolia to invade Greece had a great effect. Likewise, the huge army that Alexander the Great formed for the Indian expedition passed by trampling the Anatolian lands and plants.

During this time, the forest communities dominated by black pine (*Pinus nigra*) in Central Anatolia started to disappear or deteriorate (Çetik and Vural, 1979). According to Akman (1974), destroyed black pine (*Pinus nigra*) forests leave their place to a sparse forest cover consisting of shrubs such as downy oak (*Quercus pubescens*), hawthorn (*Crataegus* spp.), wild pear tree (*Pyrus elaeagnifolia*), and juniper (*Juniperus excelsa* and *J. oxycedrus*.) and eventually to steppes with further degradation (

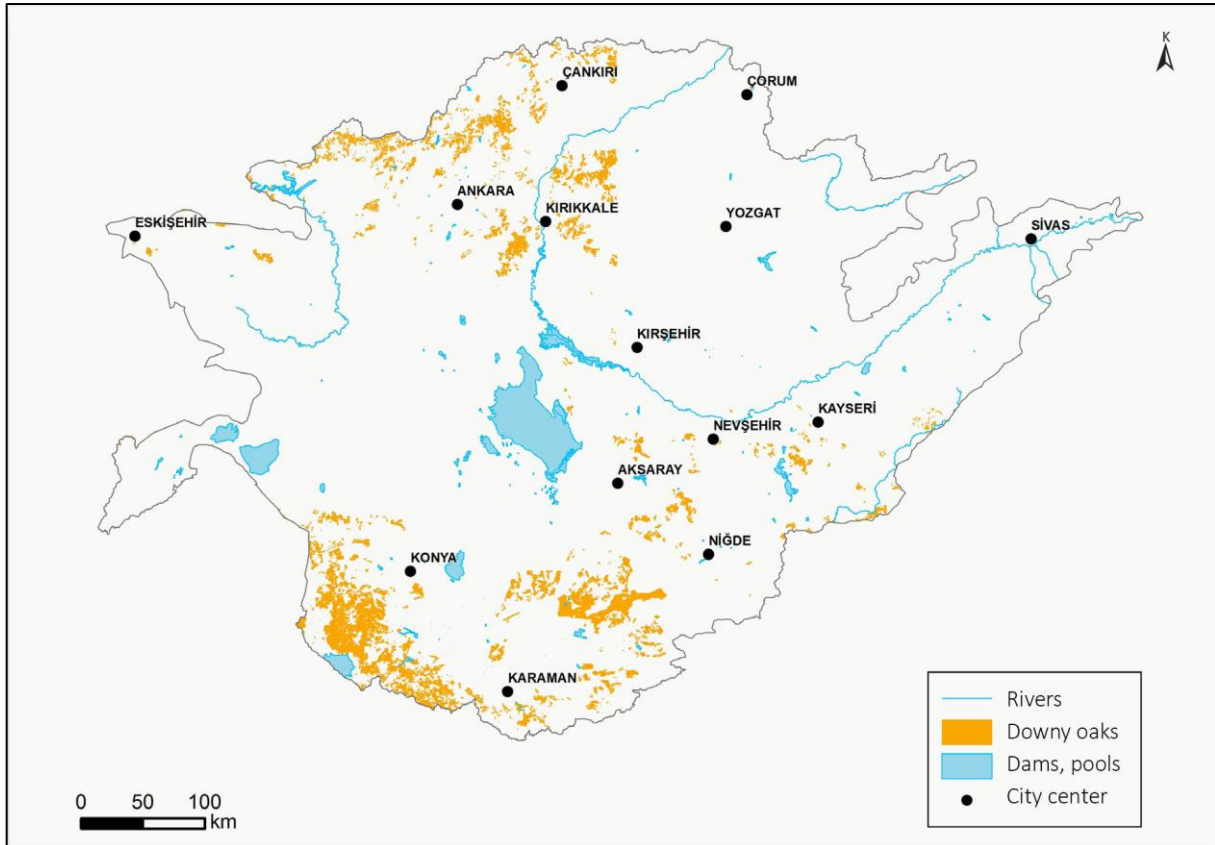


Figure 2). Oak communities in the Central Anatolia Region cover an area over >493,000 hectares.

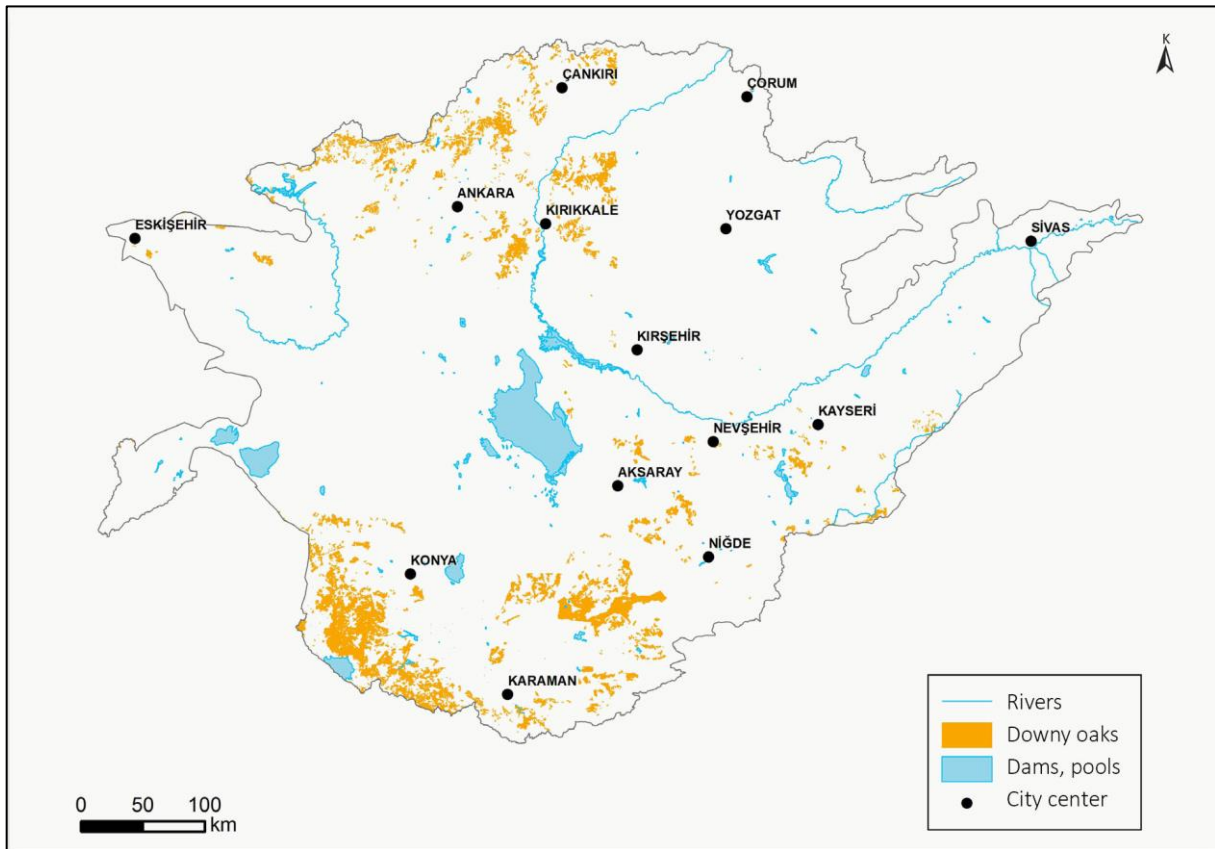
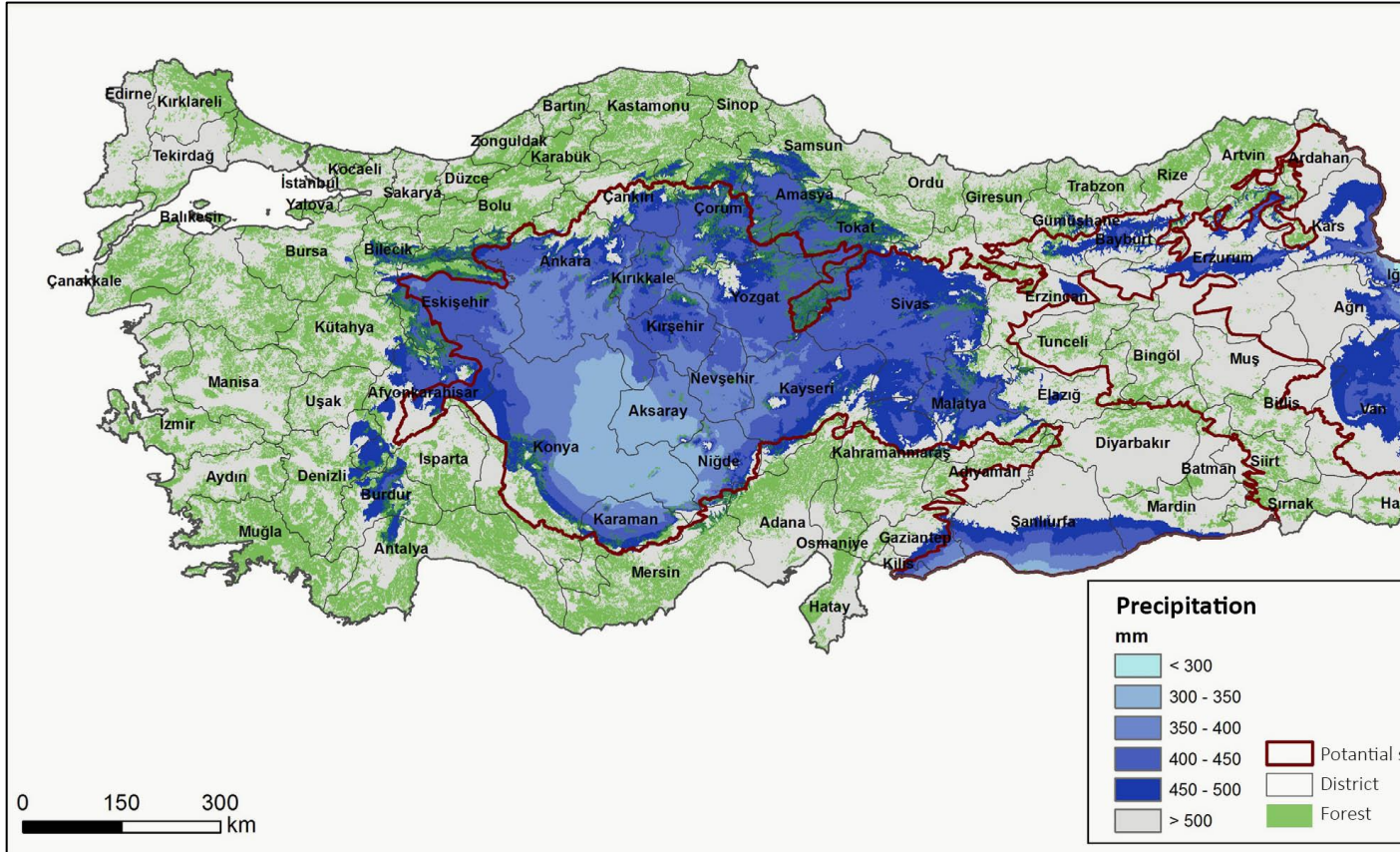


Figure 2. The distribution of swamp oaks in the Central Anatolia Region has been used as an indicator in the past to determine the distribution of forests and steppes of anthropogenic character. ©DKM

Nevertheless, in order to explain the distribution of existing forest and steppe cover, it is necessary to investigate the long-term climate change. It is assumed that the Würmian Ice Age played an important role in the existence of vast forests covering the arid parts of Anatolia, especially the Central Anatolian steppes. During the Würmian Ice Age, which is presumed to be 115,000 to 11,700 years ago, average temperatures are believed to drop by about 10 °C. The cold semi-desert formation in Central Anatolia (Ray and Adams, 2001) started to leave its place to forests during the warm-up period as a result of the end of this ice age approximately 10,000 years ago (Bottema et al., 1993). Approximately 5,000 years ago is shown as the period when the process related to the destruction of the forests and leaving their place to the steppe accelerated (Louis, 1939).

Nevertheless, it should be stated that the decrease in the self-renewal capacity of the forests with the drought experienced in Anatolia also has role of in this forest destruction. Considering the current climatic conditions, we can assume that it will not be possible to grow forests naturally in many areas classified as steppes of anthropogenic character under today's

conditions



Figure

3,

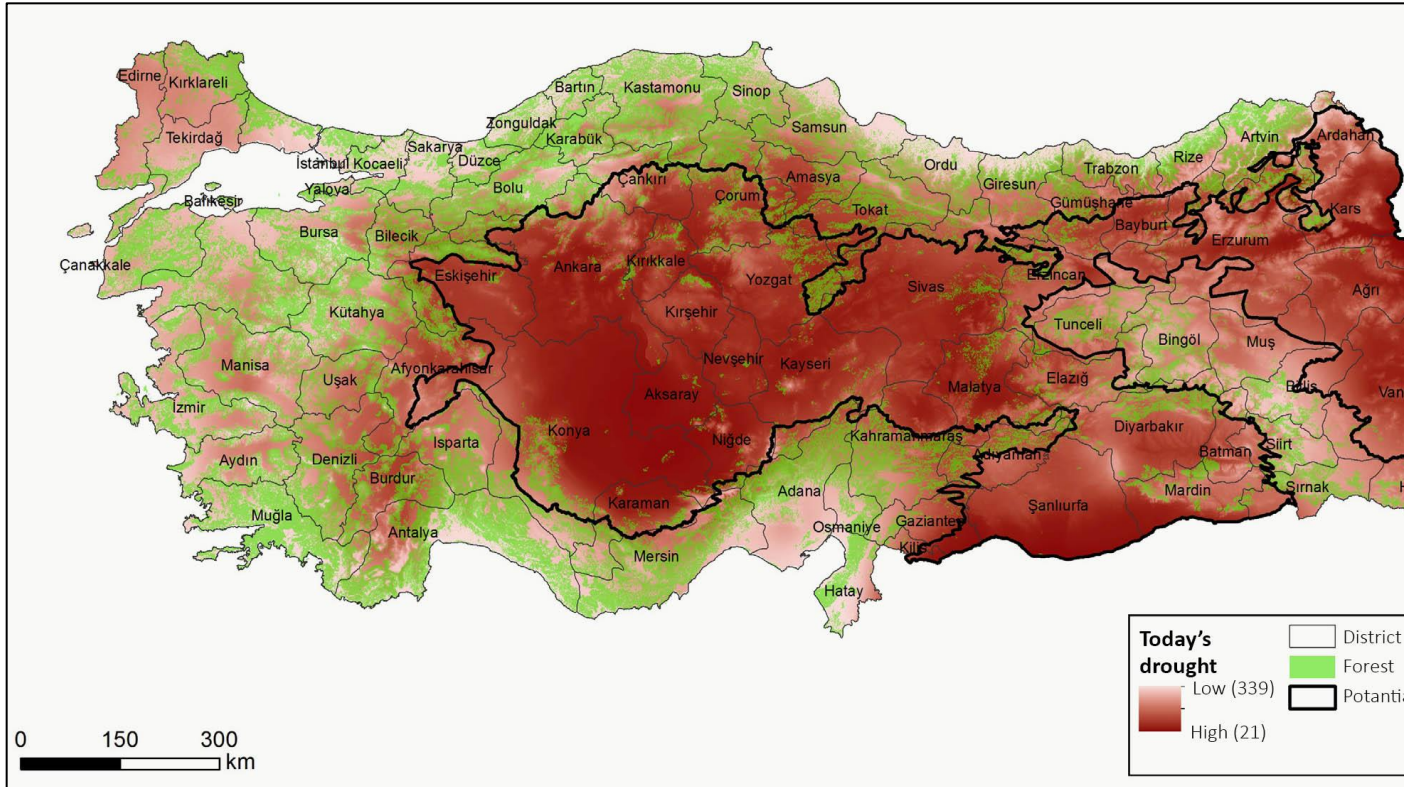


Figure 4).

Current studies and findings show that natural steppes actually spread over a wider area than previous assumptions. In order to distinguish steppes of anthropogenic character and natural steppes, it is necessary to observe at the distribution of forest remains, individual oaks (*Quercus* spp.) and black pine (*Pinus nigra*), especially in Central Anatolia, and to uncover the effects of drought experienced in the last 5,000-6,000 years on the self-renewal capacity of forests. While there are many scientific studies examining the Anatolian steppes and human interaction, Hikmet Birand's book titled "Alıç Ağacı ile Sohbetler (Conversations with the Hawthorn Tree)" (1968) has a special place in that it handles this subject in a very wide framework and explains it in a flowing, chatty style.

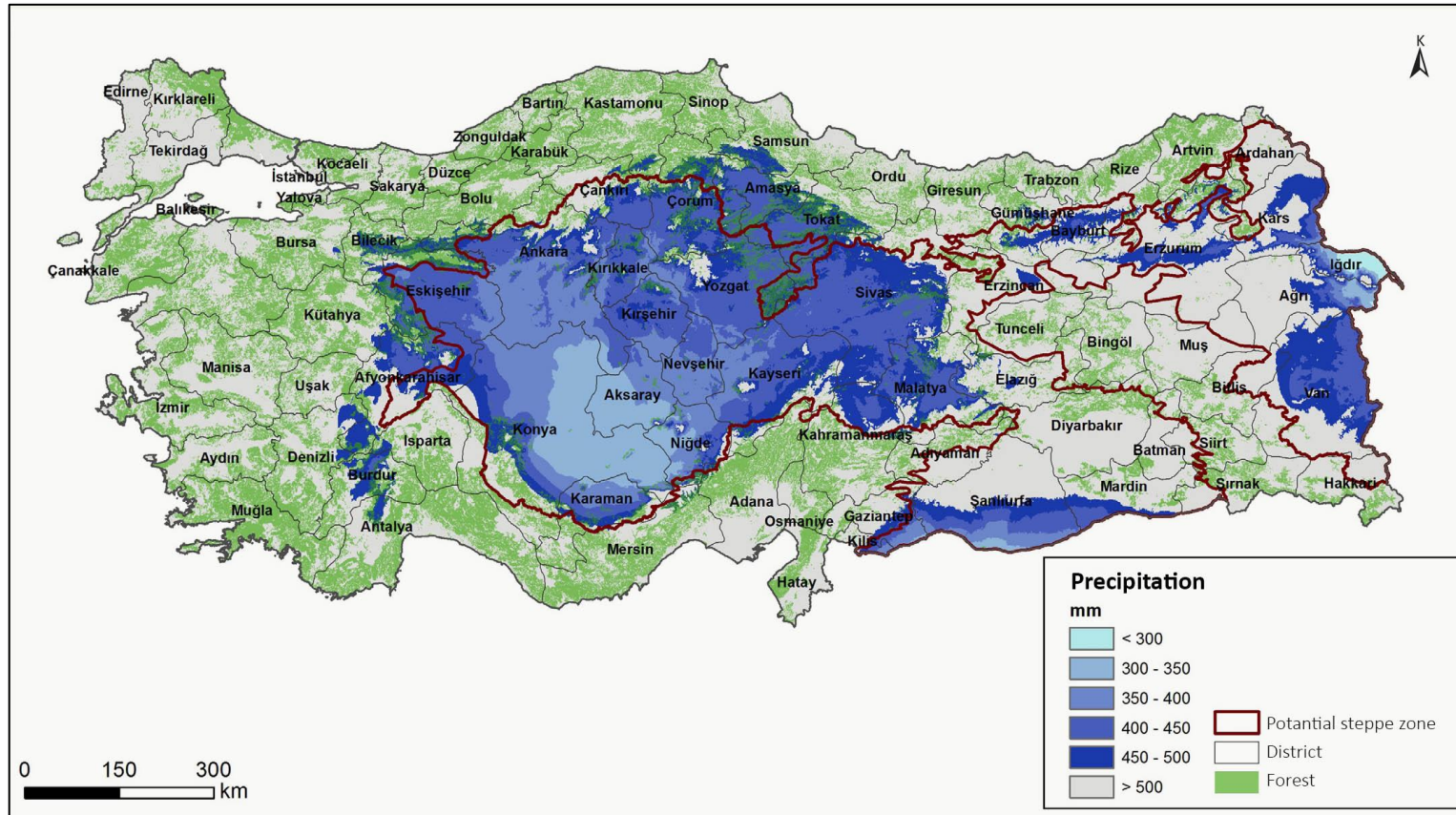


Figure 3. In relation to precipitation, distribution of current forests and potential steppe zone¹ ©DKM

¹ See Section 2.2 for details on the potential steppe zone.

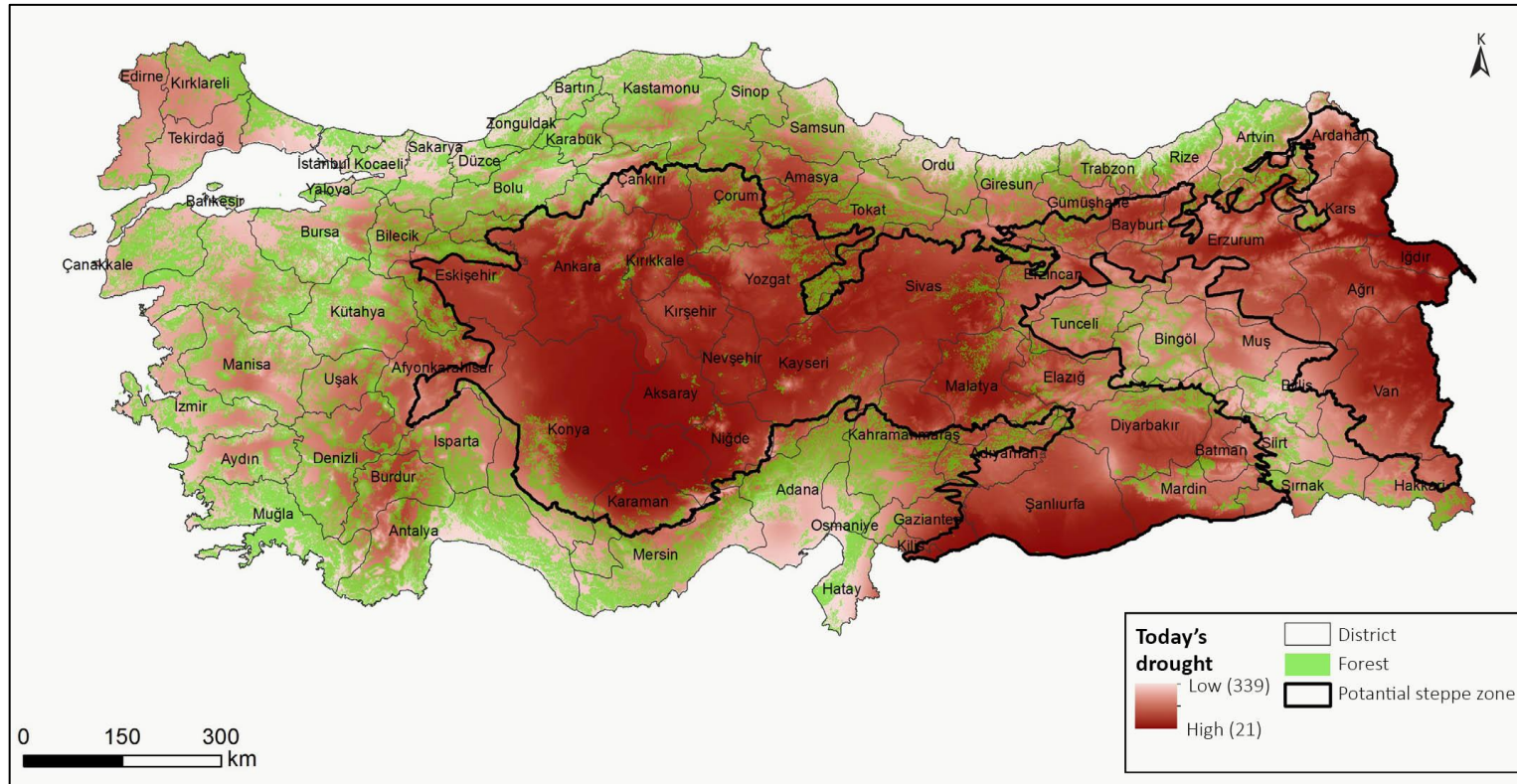


Figure 4. Today's drought values, distribution of forests and potential steppe zone on scale of the Emberger Aridity Index^{2,3} ©DKM

² In the figure, the aridity value is given on scale of the Emberger Aridity Index, and low values of the index indicate high drought, while high values indicate low drought.

³ See Section 2.2 for details on the potential steppe zone.

2.1. Classification of the Steppes of Turkey

Different approaches are used to classify and identify the steppes of Turkey. Commonly used classifications and identifications are as follows:

1. By Topographic Characteristics:

The steppe vegetation in Turkey varies depending on the elevation.

- Lowland Steppe: Steppes located in flatland or slightly sloping land
- Low Mountain Steppe: Steppes on slopes generally at 800 to 1,600 meters of altitude
- High Mountain Steppe: Steppes generally above 1,600 m

2. By Physiognomic Characteristics:

- Malacophyll Steppes: Steppes dominated by broad- and soft-leaved herbaceous plants (Walter, 1956).
- Grass (Poaceae-Gramineae) Steppes: Steppes dominated by the Poaceae.
- Tragacanth Steppes: Steppes dominated by cushion-forming shrubs such as milkvetch (*Astragalus*), prickly thrift (*Acantholimon*).

3. By Geographical Distribution:

- The Central Anatolian Steppes
- The Eastern Anatolian Steppes
- The Southeastern Anatolian Steppes

Box. Steppes of Turkey According to the Geographical Regions

We think that providing information about the floristic features of Turkey steppes according to geographical regions is the easiest method to be followed:

The Steppes of Central Anatolian:

Grasses such as *Bromus tomentollus*, *Festuca valeiaca*, *Rostraria cristata*, *Stipa lessingiana*, *Stipa holosericea* and cushion-forming chamaephytes such as *Astragalus angustifolius*, *Astragalus microcephalus*, and *Onobrychis cornuta* are dominant species in the Central Anatolian Steppes. In the more arid southern regions, especially in Salt Lake Basin, the plants from the families of Amaranthaceae, Plumbaginaceae are more common. Mediterranean and Irano-Turanian endemics are seen abundantly in Central Anatolia. Especially in Çankırı, Sivas, Ankara (between Beypazarı-Sivrihisar) there are many narrow-ranged endemics in gypsum-bearing and marly soils. Likewise, the steppes in the Mediterranean mountain level above 1,500 m are also rich in species specific to the Mediterranean phytogeographical region. The species that can be listed in this region are *Festuca cyllenica*, *Helictotrichon pubescens*, *Marrubium astracanicum*, *Marrubium lutescens*, *Tanacetum armenum*, *Helicrysum plicatum*,

Chaaecytisus ericarpus, *Astragalus angustifolius*, *Astragalus microcephalus*, and *Onobrychis cornuta*.

The first scientist to research the halophilic steppes in the Central Anatolia Region was Birand (1961). The important species in the halophilic steppes are: *Champhorosma monspeliaca*, *Pucinellia convulata*, *Petrosimonia brachiata*, *Aeluropus littoralis*, *Halimione verrucifera* and *Frankenia hirsuta*.

The steppe communities of the Central Anatolia belong to the *Astragalo microcephali* - *Brometea tomentelli* (Quézel, 1973) class, *Onobrychido armenea* - *Thymetalia leucostomi* (Akman et al., 1985) order in terms of plant sociology.

The Steppe Vegetation of Eastern Anatolia:

Average altitude in Eastern Anatolia is over 1,400 m. These steppes, where precipitation is slightly higher than in Central Anatolia, are used extensively in terms of animal husbandry. Animal husbandry, based on seasonal migration in large herds, is also an important economic activity for the country.

The main species in the high mountain steppes in the Eastern Anatolia are as follows: *Festuca cyllenica*, *Agrostris stolonifera*, *Alopecurua aequalis*, *Bromus pumilio*, *Dactylis glomerata*, *Gaudiniopsis macra*, *Phleum pratense*, *Poa nemoralis*, *Poa bulbosa*, *Poa pratensis* *Acanthus dioscoridis*, *Aster alpinus*, *Helichrysum plicatum*, *Myosotis lithospermifolia*, *Sibbaldia parviflora*, *Alchemilla caucasica*, *Anthemis cretica*, *Draba brunifolia*, *Gentiana verna*, *Minuartia anatolica*.

In the slightly sloping and bottom lands where groundwater is higher and alluvial-hydromorphic soil is dominant are mountain meadows dominated by mesophilous species, with an overlap approaching 100%. The main species of these habitats can be listed as follows: *Anthemis cretica*, *Bromus japonicus*, *Centaurea depressa*, *Dianthus calocephalus*, *Eromopoa persica*, *Erigeron acris*, *Filago arvensis*, *Filipendula vulgaris*, *Gladiolus atroviolaceus*, *Lotus corniculatus*, *Medicago x varia*, *Onobrychis stenostachya*, *Papaver orientale*, *Papaver rhoeas*, *Phleum montanum*, *Rumex acetosa*, *Rumex alpinus*, *Sanguisorba minor*, *Salvia verticillata*, *Trifolium repens*, *Trifolium pratense* and *Vicia cracca*.

The steppe communities of the Eastern Anatolia belong to the *Astragalo microcephali* – *Brometea tomentelli* (Quézel, 1973) class, *Festuca oreophila* - *Veronicetella orientalis* (Hamzaoğlu, 2006) order in terms of plant sociology.

The Steppes of Southeastern Anatolia:

The steppes of Southeastern Anatolian Region, also called the lowland steppes, are located in the north-end of the Syrian-Middle East Desert. The fact that the region has hosted many civilizations since the Sumerians and is the place where agriculture started, also caused the destruction of the vegetation cover to a great extent. *Artemisia* steppes, which are expected to cover large areas, are largely destroyed in the area. A significant part of the steppes of the region has been converted to agricultural fields, whilst the species composition of the remaining part has changed due to overgrazing. The main species of these steppes can be listed as *Gundelia tournefortii*, *Eryngium campestre*, *Centaurea virgata*, *Scutellaria orientalis*, *Phlomis kurdica*, *Aegilops triuncialis*, *Avena sterilis*, *Xeranthemum annuum*, and *Phlomis bruguieri*.

The steppe communities of the Southeastern Anatolia belong to the *Astragalo microcephali - Brometea tomentelli* (Quézel, 1973) class in terms of plant sociology.

Box. Classifying and Mapping Steppes

According to the basic physiognomic classification systems used in mapping studies (di Gregorio, 2005; UNESCO, 1973; Grossman, 1998), in the steppes evaluated within the “Herbaceous Vegetation” class, the dominant cover should be herbaceous plants and the ratio of trees or shrubs in this cover should be less than 20-25%. Many steppe areas of Turkey, except Southeastern Anatolia and Salt Lake Basin, are intertwined with trees and shrubs. This type of areas is called as steppes with trees. In addition to this, areas that form sparse or closed forests in ecological regions dominated by steppes are also called steppe-forest. Tree cover in these areas is more than 20-25%.

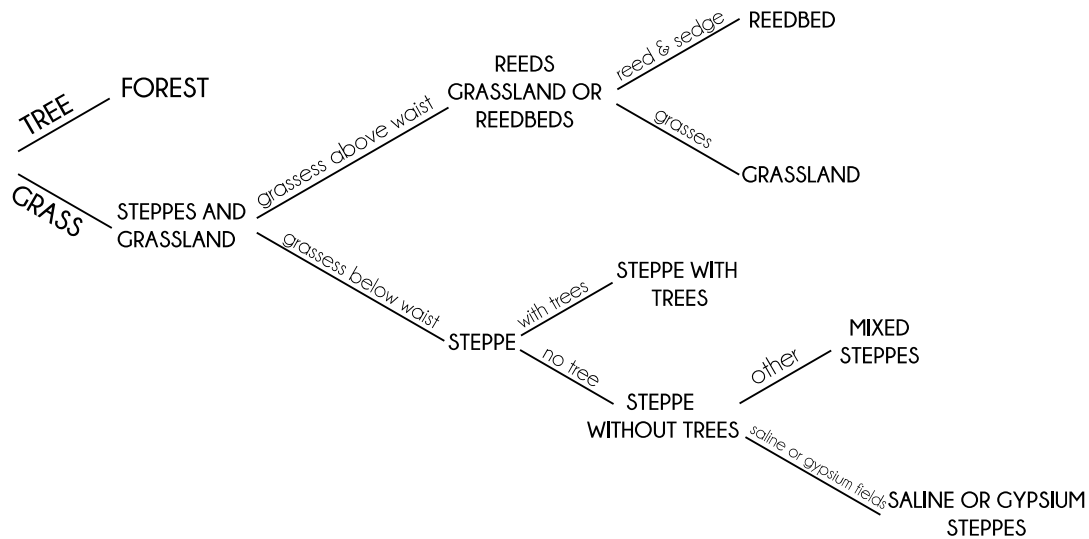


Figure 5. A simple diagram showing the classification of steppes according to their physiognomic and other characteristics ©DKM

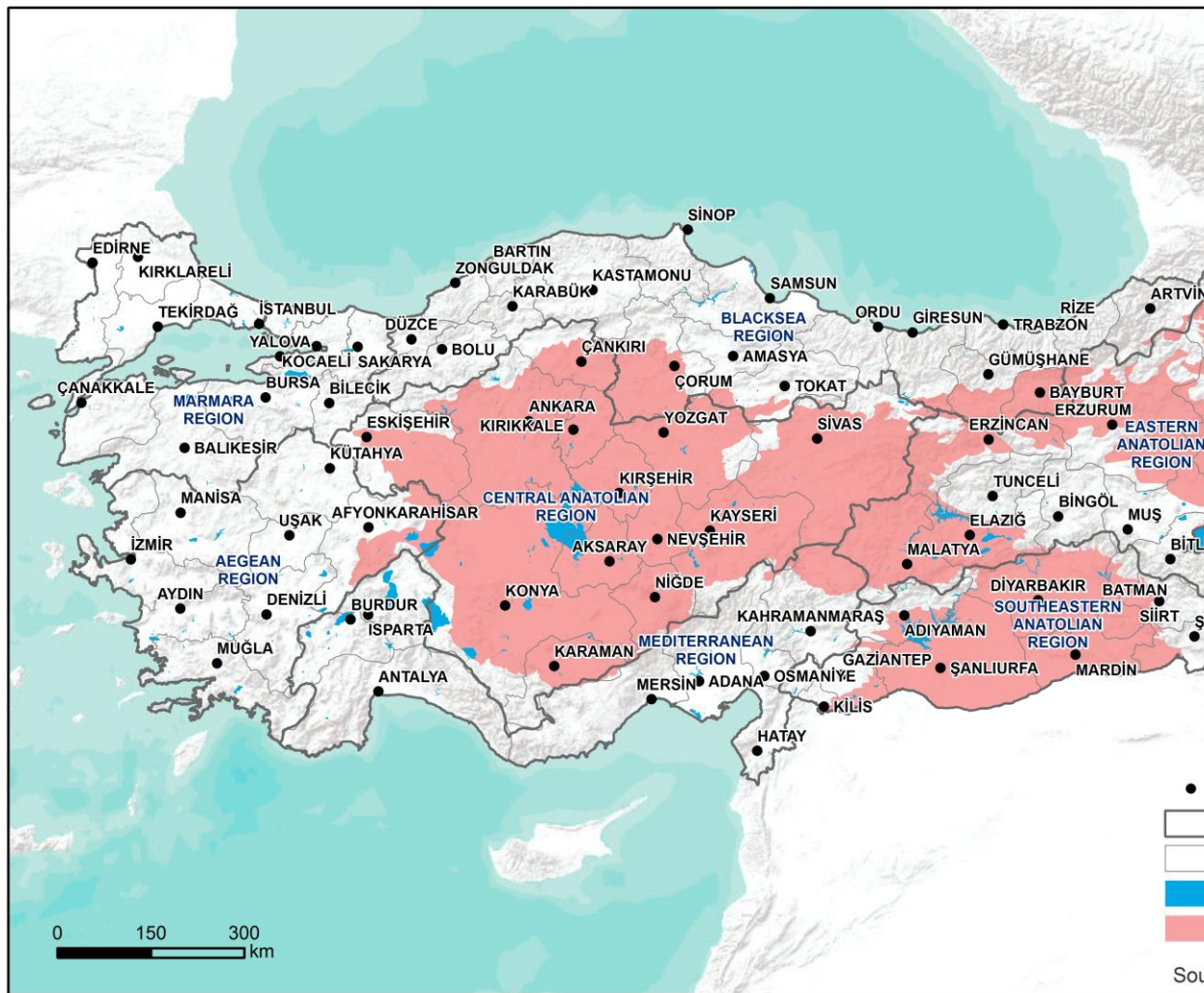
Box. What is the difference between steppe, meadow and rangeland?

Steppe	Meadow	Rangeland
<ul style="list-style-type: none"> - A type of land cover - Dominated by xerophytic, short herbaceous plants - It spreads in the temperate zone - 300-500 mm of annual average precipitation - Groundwater is low - Woody plants are few 	<ul style="list-style-type: none"> - A type of land cover - Dominated by moist, tall herbaceous plants - It is distributed in the temperate zone - The amount of precipitation is higher than the steppe - Groundwater is high - Woody plants are few 	<ul style="list-style-type: none"> - A type of land use - The place allocated for grazing animals and for benefiting from their grasses or used for these purposes since ancient times

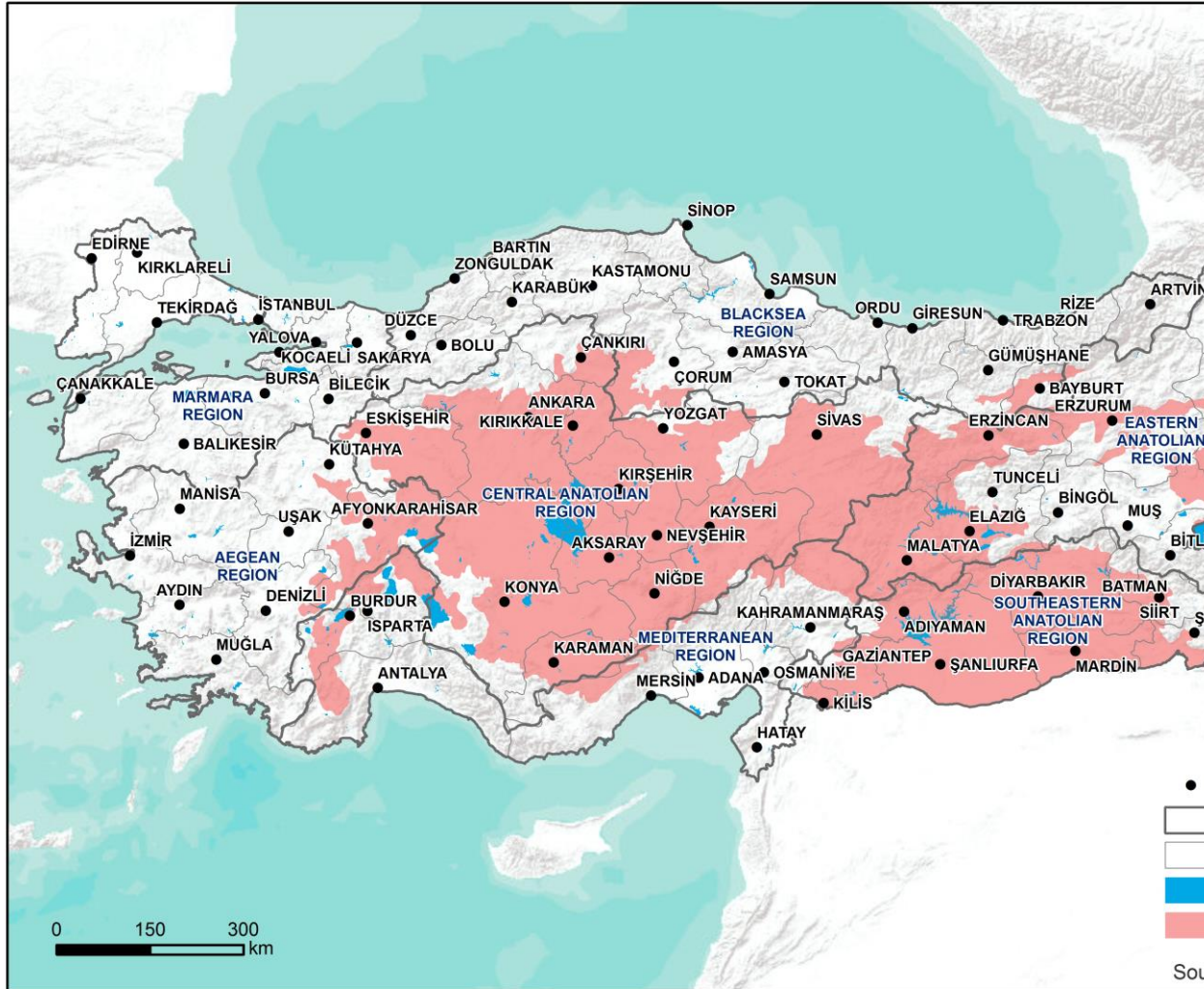
2.2. Determining the Borders of Turkey's Steppe Zone

Regarding the determination of the steppe border of Turkey (the region covering areas, which can hold steppe ecosystems) two different studies have been carried out recently:

1. The study coordinated by Nature Conservation Centre (



2. **Figure 6;** Ambarlı et al., 2016),
3. The study carried out within the scope of Ecosystem-Based Adaptation (EBA) to Climate Change in Steppe Ecosystems Project conducted cooperatively by the Ministry of Agriculture and Forestry and the Food and Agriculture Organization of the United Nations between the years 2017-2019



4. Figure 7).

The potential steppe zone (the region covering areas which can hold steppe ecosystems) on which these two studies are based differ from each other. In the first study, the Anatolian Biogeography boundaries, one of the biogeographic regions produced by the European Environment Agency (2015), have been taken as a basis in determining the region. In addition to this, drought classes (Dufour-Dror and Ertaş, 2004) have been included. Moreover, as indicators, tree species such as Turkish pine (*Pinus brutia*), Scots pine (*Pinus sylvestris*), beech (*Fagus orientalis*), spruce (*Picea orientalis*), cedar (*Cedrus libani*), fir (*Abies* spp.), whose distribution should not overlap with the steppe, have also been used. Attention has been paid that the areas where these species are distributed should not be included in the region. In this stage, the stand data of the General Directorate of Forestry have been used. Finally,



considering the distribution of herbaceous plant species, which are the indicators of the steppe ecosystem, the region with the steppe and steppe-forests has been determined. According to this study, the potential steppe zone covers approximately 33.5 million ha.

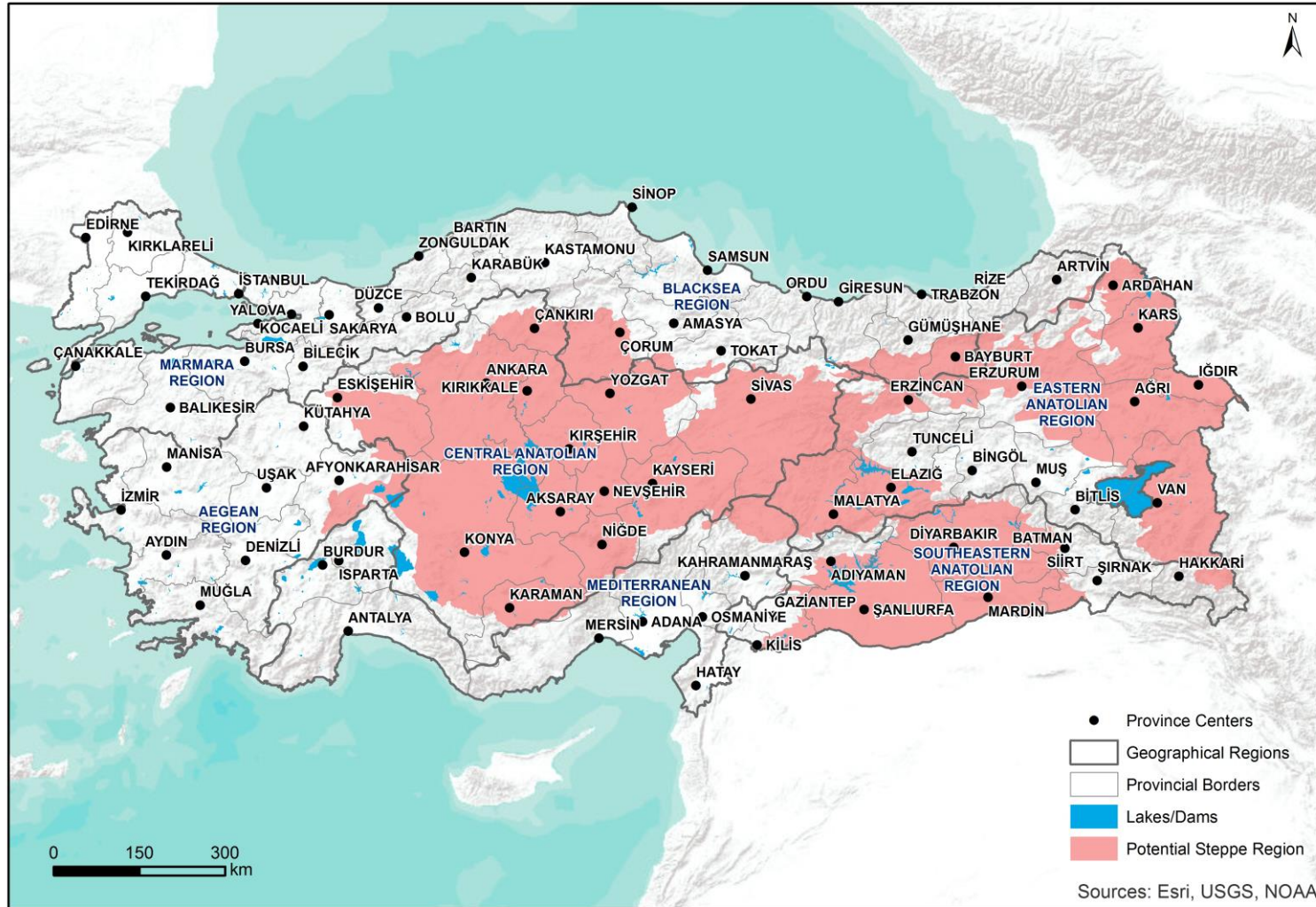


Figure 6. Turkey's potential steppe zone according to the study under the coordination of Nature Conservation Centre (Ambarlı et al., 2016) ©DKM

The second study has been carried out within the scope of Ecosystem-Based Adaptation (EBA) to Climate Change in Steppe Ecosystems Project conducted jointly by the Ministry of Agriculture and Forestry and the Food and Agriculture Organization of the United Nations between the years of 2017-2019 (Avciođlu-Çokçalışkan et al., 2018). In this Project, stand data, surface temperature, drought index, soil structure, elevation, geological formations, vegetation indices such as NDVI (Normalized Difference Vegetation Index) and EVI (Enhanced Vegetation Index) to determine the potential steppe zone have been used. Following the studies, using the potential vegetation approach in Turkey (with the help of variables such as climate, soil, and topography), the region covering areas which can hold steppe ecosystems has been determined. According to this study, the potential steppe zone covers approximately 32 million ha.

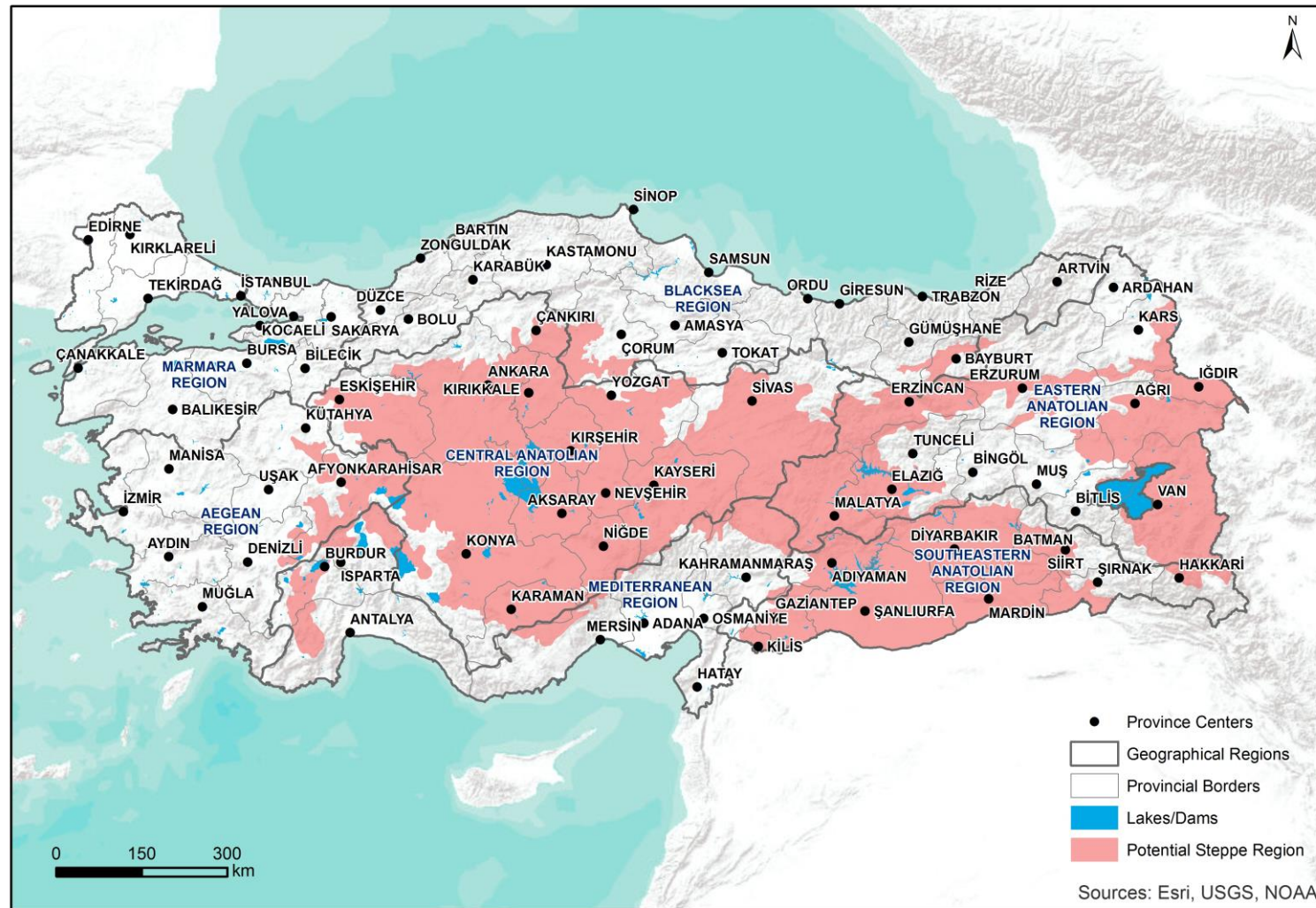


Figure 7. Turkey's potential steppe zone according to EBA Project ©DKM

2.3. Mapping of Steppes of Turkey

The distribution of steppe areas and steppe-forests of Turkey has been reconsidered by Nature Conservation Centre (DKM) within the scope of strategy developments in 2020. In this study, the necessary information has been produced based on the steppe map prepared under the coordination of DKM (Ambarlı et al., 2016). According to this study, the region potentially involving Turkey steppes and steppe-forests ecosystems (areas that form sparse or closed forests in ecological regions dominated by steppes) is distributed in an area of approximately 33.5 million hectares. This region is also the region covering areas which can hold steppe ecosystems, using potential vegetation approach (with the help of variables such as climate, soil, topography). In this region, there are many different land use types (e.g., agricultural fields, settlements, mines, etc.) other than natural steppe areas and steppe-forests. In the study of Nature Conservation Centre to determine the distribution of the existing steppe areas and steppe-forests in this region; the steppe areas are considered as areas where herbaceous vegetation is dominant and the cover of trees and shrubs is less than 10%, whereas steppe-forests are generally considered as areas where black pine and oak are dominant, and the cover of trees and shrubs is higher than 10%.

For determining the current distribution of steppe and forest-steppe ecosystems, forest management plans stand data, registered rangeland data (May 2020 data) and CORINE Land Use and Land Cover data (2018) have been used as a base. The definition of rangeland corresponds to a land use type, but rangelands are also steppe areas in terms of vegetation classification. Therefore, in evaluation of the steppe vegetation areas within the potential steppe zone, the rangeland data have also been used.

In cases where forest management plans data are not up-to-date for some Forest Operation Directorates or it was not possible to directly determine the steppe areas from some composite land classes in CORINE 2018 data, Sentinel-2 satellite images (images between the years of 2016-2019) were used. From satellite images, NDVI⁴ (Normalized Difference Vegetation Index, Rouse et al., 1974), which is an indicator of healthy vegetation structure and efficient photosynthesis function. Table 1 gives details about which classes in the base data are included in steppe and forest-steppe ecosystems. According to these analyses, within the potential steppe zone there are approximately 17 million ha of steppe area and 552,334 ha of

⁴ The images between May 1 and June 15, 2016-2017-2018 and 2019, of Sentinel-2 satellite images were filtered and passed through a cloud filter. For each image, the NDVI Index was calculated and the index mean was calculated:

$$NDVI = (B8 - B4)/(B8 + B4)$$

B4: Red band

B8: Near-infrared band

forest-steppe. Spatial representation of steppe areas and steppe-forests is given in



Figure 8.

Table 1. Data used to determine the steppe and forest-steppe ecosystems and their details

Steppes	Proprietary Rangelands
	Rangelands (231), Natural Meadows (321), Bare Rocks (332), Sparse Vegetation Areas (333) in CORINE (2018) Land Use and Land Cover data
	Areas with NDVI value <0.3 among Agricultural Fields Mixed with Natural Vegetation (243) in CORINE (2018) Land Use and Land Cover data
	Areas with NDVI value <0.5 among Plant Change Areas (324) in CORINE (2018) Land Use and Land Cover data
	Areas with NDVI value <0.5 among forests with cover less than 40% according to forest management plans

Steppe-Forests	Forest polygons with cover higher than 40% (2 and 3 closed) according to forest management plans
	Areas with NDVI value >0.5 among forests with cover less than 40% according to forest management plans
	Areas with NDVI value >0.5 among Plant Change Areas (324) and Sclerophyll Vegetation areas (323) in CORINE (2018) Land Use and Land Cover data

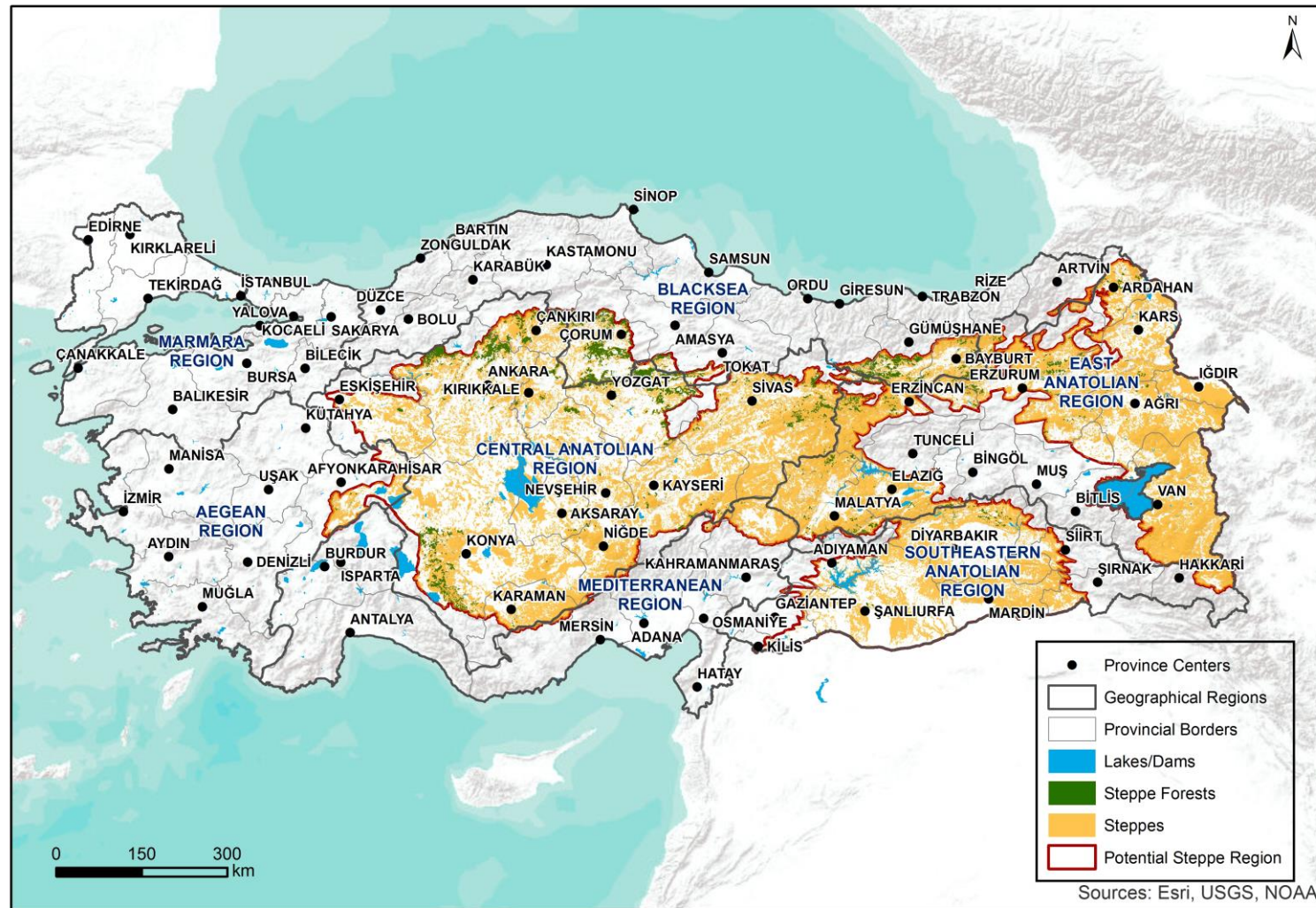


Figure 8. Distribution of steppe areas (approximately 17 million ha) and steppe-forests (552,334 ha) in the potential steppe zone (Source: Nature Conservation Centre)

2.4. Plant Richness of Steppes of Turkey

The plant diversity of steppe areas represents an important part of the floristic richness of Anatolia. Most of the plant species that grow in forestlands and wetlands are generally common plants which range over a wide part of the world's temperate zone. Therefore, the endemism rate is very low in wetlands as well as in forest areas. On the contrary, grasslands and rangelands that are generally called "steppe" are extremely rich in terms of both the number of plant species and the endemism rate. The most important reason behind this is that the steppe areas provide the extraordinary, seasonal, round-the-clock change of ecological conditions (climatic conditions such as cold and rainy in winter, dry and hot in summer, and temperature difference between day and night and plenty of light) for the growth of plants as well as a rich geological structure. In places with such extreme features, only plants that can adapt to these conditions can grow.

Today, most of the parts of Anatolia with an altitude of 1,000-1,200 m have been mostly converted to agricultural fields, and the meadows and rangelands that can be described as steppes range mostly above 1,500 m. The steppe areas of Anatolia are meadows and rangelands suitable for large-scale grazing. The parts of these areas in between agricultural fields are also rich in steppe plants and can be considered as their shelters indeed. On the other hand, since halophyte (salt-tolerant plant) vegetation that forms in places where ground water is high is generally accepted as meadow-rangeland, it is considered within the steppe plant formation. Because these areas cannot be used as agricultural fields without land improvements, they are particularly covered with halophytes.

The result obtained from the evaluation of more than 7,000 taxa (taxa growing in both steppe and forests, as well as weeds have been excluded from this assessment) that have been assessed by reviewing 9 volume work entitled *Flora of Turkey* edited by British botanist P. H. Davis the first supplement volume by Davis and his assistants in 1988 and other lists and articles published after the second supplement volume prepared by Turkish botanists Güner et al. of this great work can be summarized as follows: Plants that grow in dense or sparse forests and in forest openings in the formations where woody plants, such as maquis, etc. grow, constitute approximately 40% of the number of plant taxa of aforementioned feature, while plants growing in lowland and high mountain steppes and salt meadows constitute the 60%. (Table 2). As the number of steppe plants would increase with a more precise and detailed study, the floristic richness of our steppes will become more apparent.

It is not necessary to be a professional botanist to understand plant richness of steppes. If you are a nature enthusiast, during a nature walk through a dense evergreen (e.g., pine) forest, you can observe a maximum of 10 seed plants within an area of 100 m². Since more sunlight

reaches the ground after the leaves fall in deciduous forests, the number of plant species may be close to the steppe, although not as high.

Table 2. Comparing plants of steppes and forests in Turkey

	Steppe	Forest
Volume 1	435	225
Volume 2	460	306
Volume 3	410	337
Volume 4	268	338
Volume 5	436	326
Volume 6	433	305
Volume 7	450	315
Volume 8	270	200
Volume 9	360	125
Volume 10	260	85
Volume 11	235	110
Checklists	430	200
TOTAL	4,447	2,872

If *Artemisia* steppes that are heavily degraded and subjected to overgrazing and steppes dominated by halophytes in the middle parts where salt concentration is highest in halophilic areas are excluded, at least 20-30 plant species in a steppe area of the same size can be observed. If the area observed is a little larger, the number of plant species observed would also increase. *Astragalus*, *Verbascum*, *Centaurea*, *Allium* and *Silene* species, which are among the richest genera of Turkey, exhibit the richest diversity in steppe areas. Especially cushion-forming species of *Astragalus* are characteristic plant of mountain steppes. A great majority of the species of this genus grow in steppe areas. Similarly, approximately 90% of mullein species range over steppe areas. The situation is also roughly comparable for the cornflower species. Other than these three important genera, the genera which are widely ranged in steppe areas, are listed as follows according to the richness of species number: *Campanula*, *Galium*, *Alyssum*, *Trifolium*, *Onosma*, *Euphorbia*, *Salvia*, *Veronica*, *Hypericum*, *Stachys*, *Dianthus*, *Scrophularia*, *Lathyrus*, *Vicia*, *Potentilla*, *Cirsium*, *Onobrychis*, *Gypsophila*, *Trigonella*, *Arenaria*, *Bupleurum*, *Minuartia*, *Tanacetum*, *Festuca*, *Asperula*, *Scorzonera*, *Sideritis*, *Achillea*, *Sedum*, *Senecio*, *Thymus*, *Cousinia*, *Erysimum*, *Linum*, *Iris*, *Bromus*, *Aethionema*, *Phlomis*, *Papaver*, *Thlaspi*, *Nepeta*, *Convolvulus*, *Crocus*, *Isatis*, *Fritillaria*, *Alkanna*, *Hesperis*, *Medicago*, *Ferulago*, *Paronychia*, *Paracaryum*, *Ornithogalum*, *Acantholimon*, *Poa*, *Myosotis*, *Origanum*, *Pimpinella*, *Artemisia*, *Hedysarum*, *Muscari*, *Colchicum*, *Eryngium*, *Marrubium*, *Limonium*,

Linaria, Ononis, Scutellaria, Aegilops, Anchusa, Asphodeline, Ebenus, Genista, Ajuga, Lepidium, Gentiana, Ballota, Taraxacum, Tragopogon, Gagea.

2.4.1. Endemism in the Steppes

As approximately 3,500 of about 10,000 seed plants that grow in Turkey are endemic, the rate of endemism is around 35%. This number and ratio places Anatolia in an important position in terms of floristic richness and interestingness among the world countries with temperate climate. While the endemic plants of Anatolia range over various plant formations, the formations in which they range most densely are the high mountain meadows (steppes) as well as the plains. With rough estimate, if up to 10% of Anatolian endemics grow in maquis and forest areas, and perhaps the same amount on precipices (which can also be considered as steppe plants actually), the rest, roughly 80%, range over the steppe areas.

Most of the endemic species belonging to the genera common in steppes (detailed above) also grow in steppic areas. This is also valid for most of the genus whose endemic species number are less compared to these. On the other hand, many of the endemic monotypic (only has one species) genera in Anatolia also range over the steppes.

As can be understood from the information given briefly above, meadows and rangelands, especially high mountain meadows, and plant communities on the rocks within these formations are the most important plant formations of Turkey in terms of endemic species.

2.4.2. Steppes in Terms of Conservation

As is known, an endemic plant is a plant that grows only in a certain region in the world. When Turkey's flora is analyzed in detail, it is understood that most of the endemics grow in steppe areas. Most of these endemics grow in relatively wide areas. Even some of the locally grown endemics can cover larger areas. However, some rare-local endemics range over very narrow areas, in fact with very few individuals that can be easily counted.

Two examples of this type of local endemics can be given. One of them is *Cyanus tchihatchefii* ("yanardöner" in Turkish). It grows only in the waterfront agricultural fields in Gölbaşı district, Ankara. Although in recent years it has been observed that it grows in the agricultural fields near a pond in the west of Kulu, it is understood that this is a very limited and small area considering the whole world. Another example is *Campanula ekimiana* ("ekim çanı" in Turkish). It is a rare-local endemic species that grows on the basalt rocks near the Güvem-

Fındıklı village in the Kızılcahamam district, Ankara, and has a small community in the world only from this locality.

The steppes, the richest and most interesting piece of land in Anatolia in terms of plant diversity, have the least protected areas despite their richness and interestingness. National parks and nature conservation areas established in Anatolia are mostly located in forest areas. Nevertheless, the acceleration of the efforts to establish new nature conservation areas in steppes in recent years is a good development. In the future, an increase in the number of such areas will be the most serious measure that can be taken for biodiversity conservation. In protected areas, at first glance, it seems that only plant species are protected, but in fact animal species (vertebrate and especially invertebrate) dependent on them in terms of nutrition and shelter will also be protected together with plants.

Especially the establishment of a national botanical garden, where the plants that are most threatened will be grown and their seeds will be preserved, in other words, their *ex-situ* protection will be ensured, and that it should carry out effective studies in this field is a point to be emphasized very carefully. In Turkey, where plants of different phytogeographical regions grow, the presence of branches of the national botanical gardens, at least in each of the geographical regions is a necessity.

This text, in which the plant richness of steppes of Turkey is introduced, is taken from the following source:

Ekim, T., Kart Gür, M. (editors) 2019. Alıç Ağacının Gölgesinde Anadolu Bozkırları. Türkiye İş Bankası Kültür Yayınları, İstanbul.

2.5. Animal Richness of Steppes of Turkey

Steppes of Turkey have hosted thousands of species since the last Ice Age, and even before. Although the changing climate and human activities have expanded or narrowed the steppe boundaries in Turkey, many of the typical plant and animal species have survived from those times to the present.

The first and most comprehensive assessment of the zoogeography of Turkey' steppes has carried out by Curt Kosswig (1955). According to Kosswig, known as the father of zoology in Turkey, with the ending of the ice age 10-14 thousand years ago, Eremial (desert-related) faunal elements have infiltrated from the south and east and formed communities that overlapped from time to time with species specific to cold steppes that lived in earlier periods. Although there is no sharp contrast as in the case of plants, there are differences between the Central Anatolia steppes and the Eastern/Southeastern Anatolian steppes. Southeastern Anatolia is home to more species specific to the steppes, as it is adjacent to the great desert and semi-desert geography to its south. This goes especially for reptile species. The Central Anatolian steppes differ from the Southeastern Anatolia by the presence of some species specific to the Black Sea/Caspian northern steppes. The Anatolian Diagonal creates a biogeographical border that separates these two regions from each other. In the steppes (with trees) of Thrace, there are mostly species observed in similar habitats of Central and Eastern Europe.

Most animal species have developed adaptations (adaptation strategies) under the pressure of vital environmental conditions such as the strong seasonality experienced in the steppe and the lack of hiding places. These adaptations include the solutions such as follows; hibernation, aestivation, migration behavior to deal with seasonal variability; enhanced digestive physiology and microbial symbiosis enabling herbivorous nutrition in response to the relatively abundant but difficultly digested contents of the dominant herbaceous plants in terms of biomass; quick escape, invisibility through camouflage, and nocturnal or underground life for protection from their enemies.

In the Central and Southeastern Anatolian steppes, there is a dry period starting from June to September, which continues with increasing intensity. Other than the plants that can reach water thanks to their deep roots, all either dies after giving seeds in the beginning of this period or overwinter in a dry form by stopping their growth. This period is a difficult period for both herbivorous animals and plant-dependent invertebrates and predators that feed on them. Therefore, many steppe species try to complete their reproduction cycle before the hot

summer months arrive. Those that start breeding as soon as possible have an advantage over others, because they end this process early.

Another solution to avoid heat and drought is to go to aestivation by lowering the metabolism in a place that can minimize water loss during dry season, as do snails and some insects. These species get active at the end of summer and continue their normal lives.

Winter season is another problematic period, especially for animals living in higher grounds. Most invertebrates overwinter in the form of egg or pupa. However, in terms of physiology and behavioral science, the most interesting adaptation is undoubtedly hibernation. Before the cold arrives, many resident mammals, reptiles, and amphibians prepare for winter by storing energy in the form of fat in their bodies. During hibernation in a suitable cavity under the ground, their body temperature, energy consumption and metabolism rate decrease. Thanks to detailed studies on ground squirrels, we know quite well the hibernation cycle of a typical steppe creature (Kart Gür and Gür, 2018). Ground squirrels usually hibernate in a cavity in August, staying there from late February to early March. Their body temperatures range between 5-15 °C during the hibernation. During an awakening every few weeks during hibernation, the body temperature rises to 35 °C for a short time and metabolism products accumulated in the body are processed to prevent harmful effects.

In the face of these unfavorable conditions, among the non-hibernating species, the animals with high mobility such as birds, bats and butterflies migrate. For instance, almost all insectivorous birds fly to subtropical and tropical regions south of Africa's Sahara Desert in the months of September-October. On the other hand, the high re-productivity in the steppe in between April and June and the accompanying abundance of food offer ideal conditions for the migrants to raise their young. The return of migratory birds to breed is in March-May. Although some die in the difficult long distances covered, these long migrations enable the species to overwinter under favorable conditions and to continue their population.

Another common adaptation in the steppe is hiding through camouflage (similarity of appearance to the background). It is very difficult to hide from predatory species in a habitat where vegetation is sparse and short. However, species that liken their appearance to the soil or vegetation around them can be successful thanks to these features. Larks (Alaudidae) from the birds, orthopteras (Orthoptera) from the insects, and lizards from the reptiles stand out in camouflage.

A group of mammals and amphibians chose nocturnal life both to minimize water loss and to stay protected from predatory species active in the daytime. For these animals, which usually

spend the day in a cavity under the ground, the life begins at sunset. Sense of hearing and sight of these species, which are active all night long, are well developed.

Underground life represents an important aspect of the ecology of not only nocturnal species, but also for many diurnal mammals, reptiles, frogs and even bird species. Even a few centimeters below the ground is cooler in summer and warmer in winter, and it provides a shelter out of reach of many predators. Therefore, the advantages of a cavity under the ground become apparent in open biotopes such as a steppe. It has been observed that different species sometimes coexist in such cavities. Also, for hibernating species, subsoil creates the safest environment.

Here, we should mention the mole rat species that spends almost its entire life underground due to the advantages of the subsoil and have successfully adapted to this environment in many aspects. Mole rats are often confused with insectivorous moles that live in more humid environments, but mole rats differ from them in that they are rodents that use their forelegs rather than their teeth to dig in the ground. The mole rat that feeds on the underground organs of plants, can keep out of above-ground dangers through the tunnels they dug. They carry the soil arising from the digging to the surface in clumps at regular intervals. Some ecologists define the mole rats as key species due to its “ecological engineer” feature that can change their habitat in such a way as to affect other living creatures, as they are active round-the-year, feed on plants, and cover developed plants as well as form a suitable seedbed for other plant species with their soil clumps.

Another adaptation observed in steppe animals is the long strong legs and strong aerobic metabolism, which allow the animals to quickly escape from their enemies. Most of the herbivorous mammal species in open spaces around the world are noted for these features. From the hoofed species in Turkey, the gazelles and mountain sheep can be caught by only a few predators. William’s jerboa, one of the rodent species, escape from their enemies by jumping on their long hind legs and rapidly changing direction.

The special ecological relationship between plants and insects seen all over the world is also observed in the steppes. The pollinators of many steppe plants are bumble-bees and flies. Butterfly species typically lay their eggs only on plants belonging to a certain plant family or genus. The caterpillars hatched from these eggs are sometimes fed without being affected by chemicals that are toxic to other herbivorous insects. This special relationship can be observed between False Apollo (*Archon appolinus*) and plants of the genus *Aristolochia*, rare Steppe fritillary (*Euphydryas orientalis*) and *Scabiosa* spp., and blues (*Polyommatus* spp.) and grasses belonging to the Graminae family (Baytaş, 2019).

Two-thirds of the reptile and amphibian species recorded in Turkey live in the steppes. Most of our lizard and snake species, which are less affected by heat and thirst than other living creature groups, range over the lowland and mountain steppes. The most notable examples of our eremial fauna are also among this group.

Steppe birds are typically well-camouflaged species that spend most of their time on the ground, even some prefer running to flying. They nest on the ground. Partridges, grouses, larks, wheatears and pipits can be easily observed in our steppes. The predators such as the red hawk and kestrel, perhaps the most common birds of Turkey, spend hours soaring in the sky or waiting on a pole to catch small mammals, birds and reptiles. The steppes also serve as winter quarters for thousands of Fringillidae and Alaudidae.

Many of the small mammal species of Turkey have also adapted to the steppe environment. Vole (*Microtus* spp.) populations, which mostly live in colonies, reach high numbers in some years. Although their complex taxonomic conditions are not yet fully established, it is likely that the endemic forms such as *Microtus anatolicus* and *Microtus dogramacii* exist in Turkey. Ground squirrels (*Spermophilus* spp.) forming loose colonies have two ecologically similar species in Thrace and Anatolia. The ground squirrels differ from other small mammals in their manner of life. On the other hand, nocturnal Tristram's jird (*Meriones*), William's jerboa (*Allactaga*) and golden hamster (*Cricetidae*) species contribute significantly to the faunistic richness of the steppe.

A part of the mammal species living in steppes of Turkey are ecologically and culturally important species. Although Arabian sand gazelle (*Gazella marica*) is naturally observed only in Urfa province today, it is known that it ranged over the plains extending from the Euphrates to Cizre in the not-too-distant past. This species could survive thanks to being taken under protection within Ceylanpınar State Farm (CSF) in 1960s (Turan, 1984).

Another species whose extinction was prevented by effective conservation efforts is Anatolian mouflon (*Ovis gmelinii anatolica*). Distribution area of this species, also known as "Ceran" and is the ancestor of the domestic sheep, had been shrunk to only Konya Bozdağ area 25 years ago. Thanks to the successful resettlement studies, today, there are also small populations in Karaman, Ankara and Afyon. In the last centuries, the mouflon existed not only in many regions of Central Anatolia, but also in the Aras and Van steppes in Eastern Anatolia.

Unfortunately, other large mammal species associated with steppe, at least in Turkey, have become extinct. Aurochs (*Bos primigenius*) the ancestor of domestic cattle, is an extinct

species a few thousand years ago. Kulan (Asiatic wild ass, *Equus hemionus*), which can live in the driest and salty steppes, has become extinct in Central Anatolia about two thousand years ago and in Southeastern Anatolia a thousand years ago. Nevertheless, today, it is possible to observe its close cousins in the steppes of Iran and Central Asia. The gazelles could have been seen in the plains west of the Euphrates, even in Çukurova, in the second half of the 19th century. Likewise, at the beginning of the last century, gazelle or another type of the gazelle, which is its close cousin, existed on the Iğdır plains. However, it is more likely to see sheep herds and tractors in the habitats of these wild species today.

Of the 10,930 vascular plants, bird, butterfly, mammal and reptile/amphibian species known in Turkey, 1,130 living predominantly in the steppes - at least at national level - have been identified as threatened, near threatened (NT) or deficient data (DD) (Ambarlı et al., 2016). Among these species, there are species from every living creature group. For example, five of the reptile species (*Phrynocephalus horvathi*, *Acanthodactylus harranensis*, *Eremias pleskei*, *Montivipera wagneri*, *Vipera davevskii*) have Critical (CR) status. Similarly, among our bird species living in the steppe, steppe eagle (*Aquila nipalensis*), pallid harrier (*Circus macrourus*), saker falcon (*Falco cherrug*), little bustard (*Tetrax tetrax*), Sociable lapwing (*Vanellus gregarius*), Pin-tailed sandgrouse (*Pterocles alchata*) and desert lark (*Ammomanes deserti*) are endangered. In addition, among the steppe birds, the most endangered species is undoubtedly the great bustard (*Otis tarda*), which is an iconic, flagship among the heaviest birds of Turkey, the number of which does not exceed a few hundred. The future of this iconic species, which does not exceed a few hundred in number and is among our heaviest birds, is uncertain in Turkey.

The main reasons for the extinctions, range contractions and population declines throughout history are undoubtedly the expansion and intensification of agriculture, the development of hunting weapons and transport, and the overgrazing pressure due to domestic animals. Although notable efforts have been made and notable resources have been allocated to protect the large mammal species mentioned above and to increase their numbers, it is not possible to say the same thing for the steppe ecosystem to preserve all its functions and integrity. The percentage of protected steppe areas among current protected areas is quite low. On the other hand, it is clear that more radical solutions are needed other than establishing a conservation area. It is essential that these possible solutions are developed in a way that can turn the conservation-use balance in favor of nature but without destroying the livelihood of people, especially handling agriculture and animal husbandry with a new understanding, and if needed, use rehabilitation and restoration techniques.

2.6. Interaction between the People and Steppes in Turkey Steppes

The Anatolian steppes have been the center of civilizations throughout history. Before settled life, the foundations of belief centers such as Göbeklitepe were laid in upper Mesopotamia. Likewise, Anatolia is the center of agriculture and transition to settled life. However, as a result of all these, there has been a dramatic change in the vegetation cover.

It is known that between 8000-7000 BC, the people in Anatolia came out of caves and lived in open-sided huts and large nomad tents resembling villages (Kılınç, 1976). During this period, the people who encounter nature have learned to take advantage of the seeds and fruits of some plants, especially to collect grains, and even to store them for winter or for other bad/leaner times. In 7000-6500 B.C., they had learned how to plant and cultivate, based on the idea that the plants that are kept grew out of the ground. In this respect, especially Upper Mesopotamia is the place where agriculture was discovered (Kılınç, 1976).

After the establishment of villages and towns and the first settlements in Anatolia, in 6500-5500 BC, pottery have been discovered in Mesopotamia and spread throughout the near east and Anatolia within 500 years. There have been great advances in mining operations between 5000-4000 BC and in architecture and fine arts between 4000-3000 BC. While these urbanizations took place and separate cultures developed, nearby forests were destroyed. Because the need for timber for the buildings in these cities as well as the need for wood to be used in the ovens to burn ceramic tools and works of art, to process and to pour of copper, bronze, iron and precious metals has increased.

In the early ages, when humans came out of caves and established permanent settlements, they also domesticated the animals around them. Humans have domesticated dog as housemate around 10000 BC and goat to take benefit from its meat and milk around 7000 BC. Later, they have domesticated sheep around 6000 BC to benefit from its wool and milk. Cattle have also been domesticated by people around 500 BC (Kılınç, 1976).

Clearing of lands for agriculture, growing population, expanding settlements, increasing need for rangelands due to the development of animal husbandry and the use of wood as an energy source for heating and mining have weakened forest vegetation in the Southeast, East and Central Anatolia regions, causing the forests to convert to steppe vegetation with the Irano-Turanian character (Akman, 1974).

2.6.1. Human Activities Compatible with the Steppes – the Steppe Culture

The steppe culture has emerged as a result of diversifying and developing the possibilities of the regions where people live in order to survive. While the steppe culture formed the social and economic structure, the horse and iron comprised the most important elements of this culture. The custom, which has developed in parallel with the nomadic culture, is another important element of this culture.

Steppe nomads represent a productive (agriculture and animal husbandry) structure unlike forest, desert and fishing nomadic communities.

2.6.2. Importance of the Steppes as Genetic Reserves

Steppes are biogenetic reserve areas. One of the most important features of the steppes is that it has become the “Gene Centre” of agricultural and forage crops, including nutritional legume plants such as lentil (*Lens spp.*), chickpea (*Cicer spp.*), and vetches (*Vicia spp.*) as well as wheat (*Triticum spp.*) and barley (*Hordeum spp.*) (Harlan, 1971). In terms of genetic diversity, Turkey takes a special place in the world due to its steppes (Kurt et al., 2014). According to a classification made in this context, Anatolia is extremely rich in genetic resources because of its location at the intersection of two important gene centers (Mediterranean and Near East). (Ladizinsky, 1998;

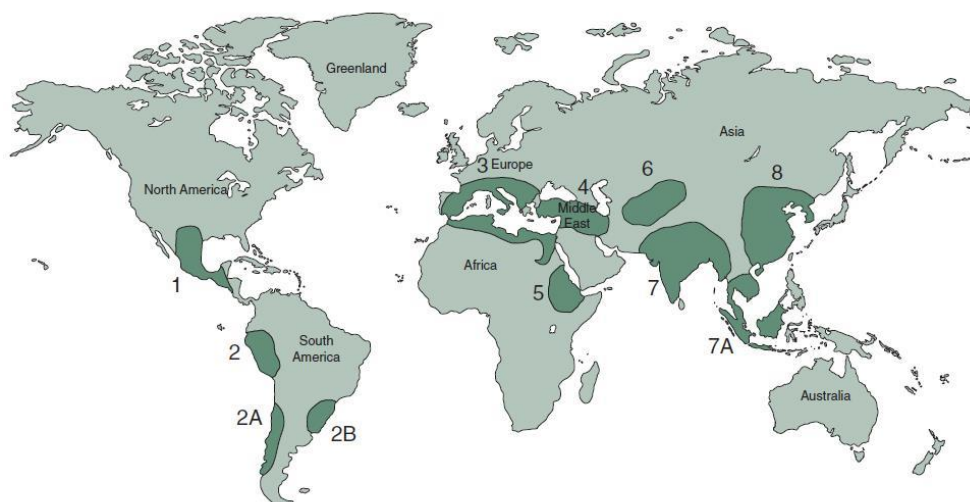


Figure 9).

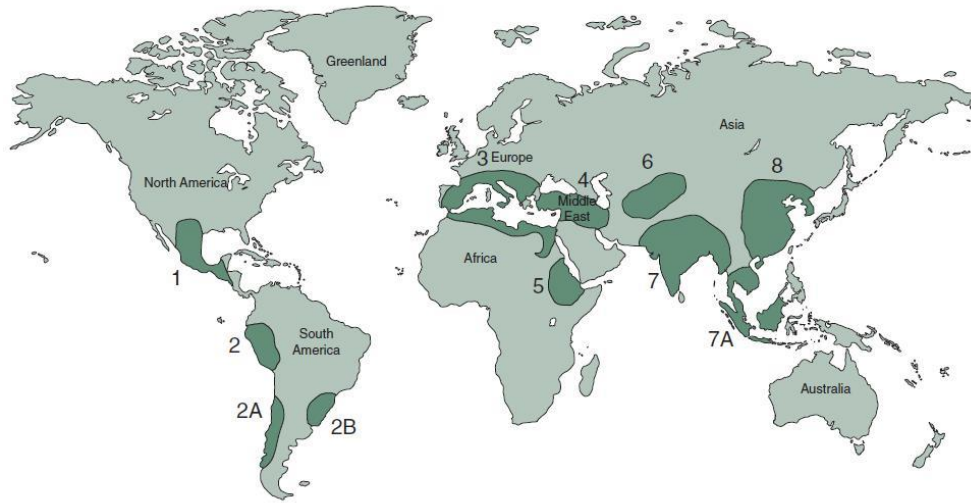


Figure 9. Main centers of cultivated plants (1 Southern Mexico and Central America, 2 North of South America – Peru, Ecuador, Bolivia, 2A Chiloe island – Islands near Chile, 2B Brazil-Paraguay, 3 Mediterranean, 4 Near East- Asia Minor- Transcaucasia, Iran and Turkey, 5 Ethiopia and Somalia, 6 Central Asia- Northwest India, Afghanistan, 7 Northeast India and Myanmar, 7A Indonesia-Malaysia, 8 China)

In Turkey there are 5 microgene centers where more than 100 species show wide variety (Harlan, 1995). In addition, Turkey is the origin or diversity center of numerous cultivated agricultural plants and other plant species. The micro-gene centers and common species in Turkey are shown in Table 3.

Table 3. The microgene centers and common species in Turkey, according to Harlan.

Microgene Centre	Species
Thrace-Aegean	Bread wheat, durum wheat, Polish wheat, Persian wheat, einkorn wheat, triticum spelta, grits, yellow melon, lentil, chickpea, common vetch, clovers.
Southeastern Anatolia	Einkorn wheat, emmer, spelt, vegetable marrow, watermelon, yellow melon, cucumber, grape, bean, lentil, chickpea, vetches, forage crops.
Samsun-Tokat-Amasya	Fruit types, bean, lentil, vetches, legume forage crops.
Kayseri and its surroundings	Apple, almond, pear, fruit types, vine, lentil, chickpea, clover, sainfoin.
Ağrı and its surroundings	Apples, apricots, sour cherry, cherry, yellow melon, forage legumes.

Anatolian steppes are considered as the formation center of some other taxonomic groups in addition to being of the gene center of many cultivated plants. Since steppe plants contain the ancestral forms of cultivated plants with this respect, they are insurance for cultivated plants.

Three important genera originated from the steppes of Anatolia are *Verbascum*, *Centaurea* and *Astragalus*. *Astragalus* genus by 450 species, 50% of which are endemic; *Verbascum* genus by 244 species, 79% of which are endemic; and *Centaurea* genus by 162 species, 64% of which are endemic species are represented. As examples of herbaceous plants; *Isatis* spp., *Draba* spp., *Alyssum* spp., *Astragalus* spp., *Alcea* spp., *Phlomis* spp., *Salvia* spp., *Verbascum* spp., *Scrophularia* spp., *Veronica* spp., *Campanula* spp., *Anthemis* spp., *Centaurea* spp., *Achillea* spp., *Allium* spp., *Iris* spp. can be given, while typical example for wood-like plants is oak *Quercus* spp.

Steppe is the last cover that holds the soil! Steppe areas, which constitute the largest rangelands in Turkey, have been subjected to a grazing pressure above their capacity since the domestication of goats and sheep. The overgrazing has caused species such as *Acantholimon*, *Astragalus* spp., *Cousinia* spp., *Alhagi pseudalhagi*, *Peganum harmala*, *Euphorbia tinctoria*, which are spiny and bitter species that animals cannot eat, to reach the zootic climactic and thus has led to the decrease or even the disappearance of characteristic steppe species in these natural areas. Due to overgrazing, the vegetation of steppes has deteriorated significantly, the species composition has changed, and nutrient-poor species have become dominant. As a result of this, erosion has been intensified in places. The most typical example of this is the not-stabilized dunes caused by wind erosion in Karapınar.

The first written information regulating the use of steppes as rangelands is seen in the famous Hittite Laws arranged by Hittites between 1390-1350 BC. From past to present, the pressures on steppe ecosystems (land clearing, grazing, etc.) have gradually increased. There was no significant change in the number of bovine and ovine animals, nevertheless, especially steppe ecosystems, which were 44 million hectares in the 1940s, declined to approximately 14 million hectares with the transition to mechanical agriculture. In many regions, especially in the great lowlands, steppes can be ranged in mosaic form especially in the slopes that cannot be cultivated among the agricultural fields.

Steppes have undertaken many ecological functions such as creating genetic reserves with the biodiversity they contain, serving as insurance for cultivated plants, and serving for different uses.

Additionally, being the cheapest roughage source in countries where animal product costs are high, as in Turkey, gives steppes a special importance. In addition, the areas where the best quality honey produced by beekeeping, which is gaining importance in recent years, are steppes.

Steppes are extremely important ecosystems in terms of the development of animal husbandry, preservation of soil and water, erosion control, and conservation of sustainable gene pool.

2.7. The Rangelands Use in Turkey

Rangelands are natural areas with a wide range of ecological and economic values, including gene pool, biodiversity, creating space for wildlife, erosion prevention, medical materials and beekeeping, as well as being places allocated for grazing animals and benefiting from their grasses or used for these purposes.

Rangelands, with unique benefits in preventing disasters such as erosion, vegetation fires, and floods are natural resources that almost insure the existence of the country together with forests. In many countries, rangelands are considered to be very important resources both in meeting the roughage need of livestock and in terms of environmental conservation. Also, these areas are considered to be very productive and profitable with high nutrient input, in regions where ecological conditions, especially rainfall are favorable (Kendir, 2017).

In Turkey, an important part of the roughage used for feeding domestic animals is met from rangelands. These forage acres still maintain their importance for animal husbandry due to their high feed potential, as well as their benefits to the environment and human health. Being the cheapest roughage source in countries where animal product costs are high, as in Turkey, gives a special importance to steppes. Since their energy consumption is high, rangelands are indispensable in the breeding of animals that need to be fed with good and quality feed; not using rangelands requires feed procurement which is costly. In addition, the areas where the best quality honey produced by beekeeping, which is gaining importance in recent years, are rangelands. Rangelands provide an average of 12-18.5% crude protein, depending on the species composition and environmental conditions, whereas the wheat straw contains 3.6% crude protein. Besides, rangeland grasses are especially rich in vitamins A, E and B and minerals. Animals that graze in rangelands are healthier and calmer. In addition, the products of animals in rangelands are better quality and delicious. (Gökkuş, 2018).

Since rangelands in Turkey are legally protected against settlement, determining the steppe and meadow ecosystems, especially around the settlements, as rangelands plays an important role in the conservation of these areas in Turkey. On the other hand, using the steppe and meadow ecosystems allocated as rangeland above their carrying capacity may cause a decrease in biodiversity.

Plant and animal species in properly managed rangelands increase the biological value of these areas, contribute to the formation, development and maturation of the soil on and in which they live, and play a key role in the sustainability of steppe ecosystems. In this way, the soil is protected thanks to the rangeland culture and can become a more suitable habitat for

many species. Rangelands contribute to the increase of soil fertility by being the source of plant nutrients, as well as by playing a role in erosion control and land reclamation, and even in crop alternation. In addition to the large number of plant species that make up the rangeland vegetation, they are very important in soil improvement because they have different root systems (such as pile roots that can go deep and fringe root that can form a dense root system in the upper soil layer) (Koç et al., 1994).

A large part of Turkey is located in the climate zone that is accepted as semi-arid. In these regions, the precipitation is low and its distribution throughout the year is irregular. The lack of rainfall is the biggest factor that restricts plant growth. By infiltrating the soil and storing natural rainfall in different layers in these regions, use of underground water reserves are increasing and the limited water is prevented from disappearing in case of runoff. Since meadows and rangelands are important catchment basins, they take a vital place in the water cycle in nature by feeding the ground waters, springs and rivers throughout the year through the penetration of natural precipitation into the soil.

According to the Pasture Law No. 4342, rangeland is “the place allocated or used for these purposes since ancient times for grazing animals and for benefiting from their grasses”. Rangelands, which are a land use type under the steppe ecosystem, also have different types. The underlying main reason for this is the emergence of different vegetation types in different ecologies. While in Bedouin geography the deserts are used as rangeland, in Central and Western Europe the artificial grazing lands, in Northern Europe the areas with dense vegetation and in Turkey steppe ecosystems are used as rangeland. (Altın et al., 2011).

2.7.1. Rangelands in the World

On a global scale, the area of rangelands total 52.5 million km². This area corresponds to approximately 40% of the terrestrial surface area, excluding the frozen areas of the world. It can be found in every region, with the largest ones in Sub-Saharan Africa (14.5 million km²) and Asia (8.9 million km²). Grasslands covering different types of vegetation are found in semi-arid regions (28% of the world's pastures), humid regions (23%), cold regions (20%), and arid regions (19%). In some sources, more than half of the total world area is defined as areas used for grazing, in other words as rangelands.

Rangelands are mostly formed on soil structures that are not suitable for agricultural practices due to topographic and climatic reasons. Most of these areas are extensively used for grazing with low input application. In European countries and New Zealand, rangelands are the areas

used for grazing intensely. Rangelands whether used extensively or intensively are the most important roughage source of animals in the countries where they are located in. In the USA, 40% of the feed consumed by animals is obtained from rangelands, 20% of which from forage crops, and 40% of which from concentrated feed. 97% of the feed consumed by ruminants in Ireland, 83% in England and 71% in France is provided from rangelands (Altın, 2006). On a global scale, rangelands contribute approximately 7% of beef production, 12% of sheep and goat meat production, and 5% of the global milk supply. Therefore, this type of land use makes a significant contribution to the supply of livestock products, the food security of shepherds, and national economic development (Dettenmaier et al., 2017).

Ownership of rangelands belongs to the public or they are private property. In many industrialized countries, public-owned rangelands are used by individual livestock enterprises for a certain rent. In the USA, public-owned rangelands are rented to private livestock enterprises by the government. Nevertheless, the use and care principles of these areas are planned by the government and private livestock enterprises implement these plans. The implementation of the plans is regulated by the government (Altın, 2006).

In industrialized countries whose economy is heavily dependent on animal husbandry, specialized livestock enterprises benefit from these types of areas. In underdeveloped or developing countries, most of which are located in the arid regions of Africa and Asia, the use and care of rangelands are unregulated, and they have been degraded to a great extent due to the unsuitable ecological conditions (Altın, 2006).

2.7.2. The Situation in Turkey

The areas with natural vegetation used for grazing in Turkey have three different status in terms of ownership. These are;

- i) Rangelands valued under the Pasture Law
- ii) Lands for grazing under the Forest Law
- iii) Public lands (used for grazing)

According to TURKSTAT data, there are approximately 14.6 million hectares of rangeland in Turkey. In addition, 12 million hectares of registered land in the forest inventory is used for grazing. For grazing activities in those areas; while the Forest Law No. 6831 is taken as a basis for forest lands and the Pasture Law No. 4342 for rangelands. There is no such legislation for public lands.

In Turkey, the biggest change among the basic land assets has been experienced in rangelands, always to disadvantage of these areas. For example; 9 million hectares of rangelands were plowed and transformed to agricultural field in 1945 with the “The Law of Making Villagers Have Lands”. In 1969, with the establishment of the Ministry of Forestry (abolished), 7.5 million hectares of shrubland have been included in the forest-heaths land. The rangeland, which was reported as 21.7 million ha in the land classification made by the General Directorate of Soil and Water of the period, was recorded as 14.6 million ha as a result of the general agricultural census. Determination studies were completed in 11.696.494 hectares of the total rangeland area, which was 21.698.400 ha in 1970 and 14.616.687 ha in 2001. Total area of rangelands decreased by 20% from 2001 to 2019. During this period, there was a serious decrease in rangeland areas. The greatest decrease was experienced in Eastern Anatolia and Aegean regions (Table 4).

Table 4. Change in the rangelands

Regions	1970 Rural Services (ha)	1991 Agricultural Census (ha)	2001 TURKSTAT Census (ha)	2019 Determined Rangeland Area (ha)	2001-2019 Change Rate (%)
Aegean	1,027,900	615,900	802,879	276,924	-66
Marmara	463,600	564,100	552,662	283,743	-49
Mediterranean	1,002,400	434,300	659,334	580,406	-12
Central Anatolia	5,884,200	3,890,300	4,570,182	4,166,634	-9
Black Sea	1,993,100	1,556,000	1,533,605	1,263,469	-18
Eastern Anatolia	9,162,100	4,573,400	5,485,449	4,337,580	-21
Southeastern Anatolia	2,165,100	743,600	1,012,576	787,739	-22
TOTAL	21,698,400	12,377,600	14,616,687	11,696,494	-20

2.7.3. Balance between the Area of Rangelands and Livestock

The number of livestock had changes in different directions in Turkey since 1970; increased from 1970 to 1980, decreased from 1980 to 2001 and then increased steadily again (Figure 10). Considering the rangelands used by livestock, a serious decrease has been experienced until 1990, and no major decrease/change was experienced in the following period. With a rough evaluation in the light of this information, it is seen that there is a constant decrease in the rangeland area per livestock animal in Turkey. These figures reveal an increase in intensity of grazing in rangelands except for between the years of 1990-2001. Increased grazing causes

weakening of the vegetation cover of the rangelands. As a matter of fact, in a study conducted that covers most of Turkey's rangelands, it has been concluded that only 12.4% of the rangelands in Turkey can produce sufficient and qualified animal feed, and the remaining 87.6% are in medium and weak conditions (Ayan et al., 2020).

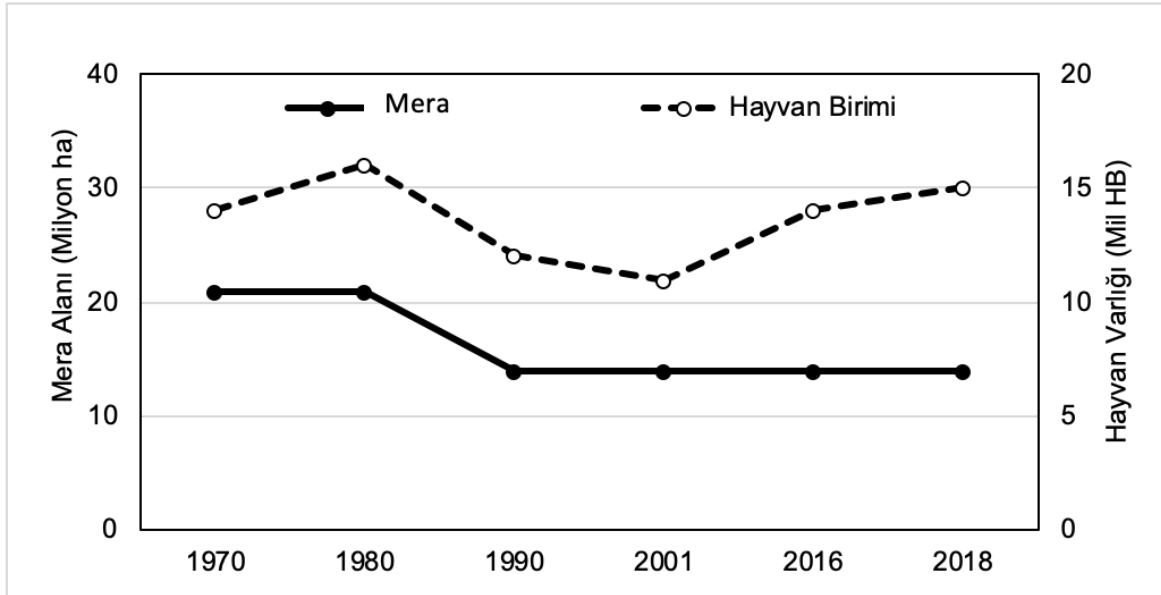


Figure 10. Change by Years in Rangeland Area and Animal Existence (1970-2018)

The fact that the rangelands in Turkey are in the status of common property can cause them to be used without necessary care and improvement. This situation is one of the biggest dilemmas of rangeland animal husbandry. Breeders benefiting from rangelands use these areas in an unlimited and uncontrolled manner generally without any other expenses than the cost of a shepherd. Even the “grazing fee” that has to be paid legally cannot always be taken from the breeders. Overgrazing in the rangelands and inability to make necessary care and improvement in return and insufficient regulations on rangelands use cause these areas to significantly lose their production potential and ecological functions.

Although the Pasture Law and the regulation enacted accordingly impose restrictions on the use of rangelands, there are problems in practice. This method of use has caused substantial land degradation in the rangelands. Especially, the rangelands in this context in the Central Anatolia Region (the slope of the rangelands in these areas is generally over 30%) have become unable to hold the soil on them.

Another important reason of rangeland degradation due to grazing is “heavy grazing”. As a result of heavy grazing, the plants do not have enough photosynthetic tissue and buds to regenerate themselves. Accordingly, the plants which have to consume more of the spare nutrients become physiologically weak and sensitive to unfavorable use and environmental factors and gradually disappear from the vegetation. Heavy grazing pressure on rangelands in Turkey is not very severe (Gökkuş, 2018). However, the risk is quite high in some, especially in the Southeastern Anatolia Region. For this reason, it is of great importance not to put any animals above the grazing capacity on the rangelands during the grazing season. Compliance with the starting and ending date of grazing and the number of animals declared is also very important for the sustainability of rangelands. The planning of grazing and grazing in accordance with plans are essential.

2.7.4. Rangeland Improvement Projects

In accordance with the purpose of the Pasture Law No. 4342, after the enactment of the law, range improvement and management projects have been performed in order to provide the care and improvement of meadow-rangeland areas allocated to a particular village or municipality, and then deliver them to Rangeland Management Unions to be established in the villages. The necessary financing for these projects is provided by the Ministry of Treasury and Finance from a separate allowance in the government budget. The primary aim of these projects is to use rangelands in a sustainable approach in villages or municipalities where rangelands are located, by establishing a balance between feed resources and livestock count over a period of 3-5 years. In order to achieve this balance, meeting the quality roughage required for the existing animal existence by taking all feed sources in the village or town into account is the primary aim of the project. For this purpose, the feed production of rangeland and feed utilization rates of animals that eat this feed are tried to be increased by techniques such as fertilization, irrigation, over seeding, sown rangeland establishment, watering through, canopy construction, and fence construction. On the other hand, forage crop planting is supported in order to close the feed deficit and to decrease the pressure on rangelands. For this purpose, seed, machinery and fertilizer support is provided. In meadow and rangelands grazed in accordance with the principles of grazing management, feed yield can increase 2-6 times. At the end of the project, the management and responsibility of the rehabilitated rangelands has been transferred to the Rangeland Management Unions established in villages (Kendir, 2017).

2.8. The Legal Framework and Institutional Structure Related to Steppes

2.8.1. The Policies, Legislation and Mechanisms Associated with the Conservation and Sustainable Management of the Steppes

In Turkey, there is no definition for steppes in the legislation as for forests and wetlands. On the other hand, the steppe ecosystems of Turkey comprise natural steppes, meadows, rangelands and degraded forests of steppic nature and there are supporting elements associated with the conservation and sustainable management of steppes in many policy documents.

In this context, while preparing this strategy and action plan, all international conventions and programs, legislation, policies and mechanisms that may be related to steppe ecosystems within the above-mentioned scope were taken into consideration.

International Conventions and Programs

The conventions that Turkey is a party to have the force of law and are part of national legislation. The main international conventions related to environment and steppe which Turkey is a party for biodiversity conservation are as follows:

- Convention on the Conservation of European Wildlife and Natural Habitats; BERN (The year of becoming a party to the convention: 1984)
- Convention on Wetlands of International Importance especially as Waterfowl Habitat; RAMSAR (The year of becoming a party to the convention: 1994)
- Convention on Biological Diversity; CBD (The year of becoming a party to the convention: 1997)
- United Nations Convention to Combat Desertification; UNCCD (The year of becoming a party to the convention: 1998)
- United Nations Framework Convention on Climate Change; UNFCCC (The year of becoming a party to the convention: 2004)
- The International Treaty on Plant Genetic Resources for Food and Agriculture; IT PGRFA (The year of becoming a party to the convention: 2006)

Most of these international conventions aim directly or indirectly for the conservation of steppe ecosystems and the biodiversity they contain. The United Nations Convention on Biological Diversity (CBD) sets out the main framework of the equitable sharing of benefits arising from the use of genetic resources with the conservation and sustainable use of steppe

biodiversity, and of how the conservation and sustainable use of steppe biodiversity can be addressed (CBD, 2019).

“Dry and Sub-humid Lands Biodiversity Programme” and “Agricultural Biodiversity Programme” under the Convention on Biological Diversity Programmes contain supportive objectives related to the conservation and sustainable use of steppe biodiversity. In particular, the importance of assessing the state and trends of biodiversity, identifying and disseminating knowledge and practices of local communities, promoting ecosystem-based resource management, and supporting sustainable livelihoods are stressed.

In addition, the United Nations Framework Convention on Climate Change (UNFCCC) is important for the sustainable use of steppe resources and improving their adaptation capacity to climate change. The United Nations Convention to Combat Desertification (UNCCD) contributes to the conservation of steppe ecosystems in line with the strategic objectives of improving the conditions of degraded ecosystems, including steppe ecosystems, combating desertification/land degradation, promoting sustainable land management and contributing to land degradation stabilization, increasing the drought tolerance of fragile ecosystems and contributing to biodiversity and climate change issues (UNCCD, 2019).

The United Nations General Assembly convened the Sustainable Development Summit in 2015 and adopted the “2030 Sustainable Development Goals (SDG)”. The Sustainable Development Goals, in other words 17 Global Goals, are a universal call for action to eradicate poverty, protect our planet, and ensure that all people live in peace and prosperity. Under Global Goal 15, the conservation, sustainable use and restoration of terrestrial ecosystems, the conservation of habitats and species, the support of fair and equitable sharing of benefits from the use of genetic resources, and the promotion of access to such resources, the prevention of illegal hunting and trafficking, the provision of financing and provision of sustainable livelihoods for local people are emphasized. This goal underlines the importance of protecting steppe ecosystems and the biodiversity they contain on the way to sustainable development (UNDP, 2019). In addition, on March 2019, the UN General Assembly declared 2021–2030 the “UN Decade on Ecosystem Restoration” and emphasized that along with the conservation of ecosystems, restoration of ecosystems is needed more than ever and is necessary to achieve the Sustainable Development Goals. This will provide ecological, social and economic benefits in many areas such as ecosystem restoration, biodiversity conservation, alleviating poverty, food security and climate change. At the same time, the UN aims to prevent, stop and reverse the degradation of ecosystems with this global initiative, which contributes to the conventions related to biodiversity, climate change and combating desertification. In this context, the

restoration of ecologically important and sensitive steppe ecosystems is becoming increasingly important.

Turkey, as a country that is a member of United Nations, is a member of the platforms and partnerships, especially organizations affiliated to the UN and other global entities. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is an independent intergovernmental body established in 2012 in order to support the formulation of policies for protection of the world's biodiversity and ecosystems and the services offered to humanity. In addition, it was established in 2012 with the membership of countries that are parties to the United Nations Food and Agriculture Organization (FAO) Global Soil Partnership (GSP) in order to contribute to the conservation and sustainable use of soils to ensure food security on a global scale. The aim of the initiative is to support main ecosystem services, protect healthy and fertile soils for food security and develop the world's limited land resources. Both of these platforms offer significant opportunities for steppe areas.

National Laws and Regulations

All laws and regulations that can contribute to the conservation and sustainable management of steppes, including regulations on conservation of biodiversity, sustainable use of natural resources, agriculture and animal husbandry practices, have been assessed in detail (Annex 1). The main laws and regulations considered in this context are as follows:

- Pasture Law (Law No. 4342 dated 25.02.1998) and Regulation on Pasture
- Forest Law (Law No. 6831 dated 31.08.1956) and Forestry Regulation
- National Afforestation and Erosion Control Mobilization Law (Law No. 4122 dated 23.07.1995), Regulation on Forest Services on Afforestation and Erosion Control, Regulation on Afforestation
- Environment Law (Law No. 2872 dated 09.08.1983)
- National Parks Law (Law No. 2873 dated 09.8.1983)
- Land Hunting Law (Law No. 4915 dated 01.07.2003)
- Law on the Conservation of Cultural and Natural Property (Law No. 2863 dated 21.07.1983)
- Wetland Conservation Regulation
- Regulation on Procedures and Principles of Determination, Registration and Approval of Protected Areas
- Agriculture Law (Law No. 5488 dated 15.04.2006), Agricultural Basins Regulation, Regulation on Good Agricultural Practices

- Soil Preservation and Land Utilization Law (Law No. 5403 dated 19.07.2005) and Law Amending the Soil Preservation and Land Utilization Law (Law No. 6537 dated 15.05.2014), Regulation on the Conservation, Use and Planning of Agricultural Land, Regulation on Supporting Producers Who Prefer the Environmentally Based Agricultural Land Protection Program and Providing Technical Assistance to These Producers
- Organic Farming Law (Law No. 5262 dated 03.12.2004) and Regulation on the Principles and Application of Organic Farming
- Agrarian Reform Act for Land Arrangements in Irrigation Areas (Law No. 3083 dated 01.12.1984), Application Regulation on Land Consolidation and On-Farm Development Services, By-Law on Protection of Water Basins and Preparation of Management Plans
- Biosafety Law (Law No. 5977 dated 26.03.2010)
- Veterinary Services, Plant Health, Food and Feed Law (Law No. 5996 dated 11.06.2010)
- Seed Law (Law No. 5553 dated 08.11.2006)
- Regulation on Removal, Production and Trade of Natural Flower Bulbs, Regulation on the Collection, Preservation and Use of Plant Genetic Resources, Regulation on Conservation of Animal Genetic Resources

A significant part of steppe ecosystems is used as rangeland/pasture in public ownership. Rangelands have three statuses in terms of ownership:

- (i) Rangelands under the Pasture Law,
- (ii) Lands for grazing under the Forest Law and
- (iii) Public lands (used for grazing). through

For regulation of grazing; Forest Law No. 6831 is taken as a base for the forest lands and Pasture Law No. 4342 is taken as base for rangelands, but there is no legislation for the public lands. The Pasture Law aims at the determination and restriction of rangelands, summer pastures, winter pastures, public pastures and meadows, their allocation on behalf of their village or municipality legal entities, their use in accordance with the rules to be determined, provision of the care and improvement to increase and maintain their productivity, continuous monitoring and protection of their use, and changing the purpose of their use when necessary. The Regulation on Pasture, which includes the procedures and principles regulating the implementation of the Pasture Law, includes administrative and executive provisions regarding the restriction and allocation of rangelands, pastures, and grasslands and grazing plans. In Turkey, the studies of determination, restriction and allocation of rangelands

still continue. Completion of these studies is important in terms of realizing the necessary conservation and sustainable resource management practices.

There is no special protected area status for steppes. Based on the National Parks Law, Land Hunting Law, Ramsar Convention and Regulation on Conservation of Wetlands, the Law on Conservation of Cultural and Natural Property, and the Environment Law, some of our natural steppe areas are included in different protected area statuses such as National Park, Natural Monument, Nature Reserve Area, Wildlife Reserve, Wetland of National Importance, Wetland of Local Importance, Special Environmental Protection Area, Natural Site Area. These laws contain provisions on the protection of the wildlife and ecosystem values offered by the areas and thus constitute an important base for the conservation of steppe areas and species.

Apart from these protection statuses, by the Soil Preservation and Land Utilization Law and related regulations, declaration of steppes as Agricultural SITE (Large Plain) in order to prevent the degradation of these areas with high agricultural potential due to erosion, aridity, pollution and misuse provides an important opportunity for steppe areas.

Another important law that directly affects the steppe areas in Turkey is the Agriculture Law. The Agriculture Law aims to develop and support the agricultural sector and the rural area and has the provisions for the conservation and development of natural and biological resources. Steppe areas are mostly classified and managed as farming areas and rangelands. In the law, the issue of agricultural basins is included as an explicit provision in order to concentrate, support, organize, specialize and integrate agricultural production in suitable areas for its own ecology. For this purpose, regulations that concern the supports for the Agricultural Basins Regulation, rural development, animal husbandry, and EBALP (Environmentally Based Agricultural Land Protection Program) provide opportunities for the sustainable use of soil and water resources, the conservation of steppes with agricultural and animal husbandry practices that support biodiversity, and reduction of the intense agricultural pressure on these areas.

The Soil Preservation and Land Use Law, which is another important law on this issue, ensures the procedures and principles for planned land use, in accordance with the principle of protection and development of the soil by preventing the loss of land and its qualifications and sustainable development that prioritize the environment. This law aims to protect agricultural fields, including agricultural lands which are steppe ecosystems. Especially all kinds of interventions to open the natural steppes to agriculture are within the scope of this law. The studies on land size and management efficiency within the scope of the law will increase productivity and reduce opening and use of marginal lands to agriculture. In addition,

the Soil Conservation Boards established in each province within the scope of the Regulation on the Conservation, Use and Planning of the Agricultural Lands have important duties such as the conservation, development and efficient use of agricultural fields, development, conservation and recovery of land features, and the fulfillment of soil conservation measures on the local scale.

Lastly, the Organic Agriculture Law and the relevant Regulation and Good Agricultural Practices Regulation are the regulations that encourage eco-friendly agricultural practices. Such practices reduce the degradation around the agricultural fields due to agricultural practices in the agricultural fields. In addition, regulations regarding foraging and protection of plant and genetic resources contribute to the conservation of steppe biodiversity.

National Policy Papers

The relevance of the policy documents with the conservation and sustainable management of the steppes are evaluated in detail under 4 different headings, namely National Development Plans and Programs, National Strategies and Action Plans, Institutional Plans and Programs, Regional Plans and Programs (GAP Region) (Annex 1). These documents have been scanned for the term “steppe” and it was seen that the term “steppe” is not mentioned in many documents. The objectives, goals and actions that can contribute to the conservation and management of steppes were examined and assessed in detail, especially in the documents that do not contain the term “steppe”.

National Development Plans

The term “steppe” is not included in the 9th, 10th, and 11th Development Plans; however, nature conservation and biodiversity policies have been included in the national programs as a part of the five-year development plan. In the 9th Development Plan, conservation and development of biodiversity and adding economic value have been determined as a priority (Article 459; Prime Ministry State Planning Organization, 2007). Among the goals and objectives in the 10th Development Plan, natural resources and ecosystem services are taken into account during policy formulation and implementation processes by measuring their value, and identification, conservation, sustainable use, development and monitoring of biodiversity, which is important for agriculture, forestry, food and pharmaceutical industries (Article 1037 and 1039; Ministry of Development, 2012). In the 11th Development Plan (2019-2023), “Determination, registration, protection, sustainable use, development, and monitoring of biodiversity and genetic resources, the prevention of their trafficking, and bringing the benefits of genetic resources and related traditional knowledge to Turkey (Article

716)” and “Effective management of nature protection areas by increasing the amount of protected areas on land and sea for the protection, restoration and sustainable use of ecosystems and ecosystem services (Article 717)” policies and measures under the title of “Environmental Protection” constitute an important base for the steppes. Under the titles of “Agriculture”, “Urban Infrastructure” and “Rural Development”, there are policies and measures related to the conservation, development and sustainable use of natural resources and biodiversity (Presidency of the Republic of Turkey, Directorate of Strategy and Budget, 2019).

National Strategy and Action Plans

The Strategy and Action Plans with direct objectives related to the conservation and sustainable management of steppes, are as follows;

- National Biodiversity Strategy and Action Plan-NBSAP (2007) and National Biodiversity Action Plan-NBAP (2018-2028)
- Ecosystem-Based Adaptation Strategy in Anatolian Steppe Ecosystems (2018)
- National Strategy and Action Plan for Combating Desertification – NSAPCD (2015-2023)
- Turkey's National Climate Change Strategy (2010-2023), Turkey's National Climate Change Strategy Action Plan– CCSAP (2011-2023) and Turkey's National Climate Change Adaptation Strategy and Action Plan – NCCASAP (2011-2023)
- National Action Plan (2011)
- Turkey's National Protected Areas and Climate Change Strategy (2011)

NBSAP emphasizes that the existing protected areas do not adequately represent the biodiversity components of Turkey, especially steppe and marine ecosystems. The Strategic Goal 5, “Conservation of steppe biodiversity, sustainable use of its components, equal and fair sharing of benefits arising from the use of genetic resources and combating the loss of steppe biodiversity and its socio-economic consequences”, includes objectives and actions related to steppe ecosystems (Ministry of Environment and Forestry, 2007). Since the NBSAP Goals and Objectives are valid during 2018-2028 and are associated with the NBAP, the national goals specified in the NBAP also support steppe ecosystems (Ministry of Agriculture and Forestry, 2019a). Ecosystem-Based Adaptation Strategy in Anatolian Steppe Ecosystems includes goals related to the conservation and management of steppes under many different titles, aiming to facilitate and encourage ecosystem-based adaptation strategies and practices in steppe ecosystems for adaptation to climate change (Avcıoğlu-Çokçalışkan et al., 2018; Doğa Koruma Merkezi, 2018). In the Climate Change and Climate Change Adaptation Strategy and Action Plans, there are objectives for determining the carbon sequestration potential of steppe areas

and determining and monitoring the effects of climate change on steppe ecosystems and developing adaptation measures (Ministry of Environment and Urbanization, 2011a, 2011b, 2011c). In addition, the objectives and actions related to agriculture and food security, land use, forestry, water resources management, ecosystem services and biodiversity contribute to the conservation and sustainable management of steppe ecosystems. NSAPCD includes outputs and actions directly related to the improvement of steppe ecosystems, increasing management efficiency and ensuring their representation in the protection system (Ministry of Forestry and Water Affairs, 2015).

In the other Strategy and Action Plans specified in Annex 1, the term “steppe” is not mentioned and there is no policy and measure directly related to steppe ecosystems. On the other hand, all Strategy and Action Plans include related indirect goals and actions that can contribute to the conservation and sustainable management of steppe ecosystems under agriculture and food security, forestry, land use, climate change and adaptation, rangeland and animal husbandry management, rural development, environmental protection, natural resource management, water management, drought, biodiversity and ecosystem services.

Institutional Plan and Programs

In the Strategic Plan of the Ministry of Agriculture and Forestry (2019-2023), the term “steppe” is not mentioned, but the terms “meadow” and “rangeland” are included. This Strategic Plan includes goals and strategies that can contribute to the conservation and management of steppe ecosystems under the objectives of increasing welfare in rural areas, increasing productivity and quality in agricultural production; sustainable management of soil and water resources; combating climate change, desertification and erosion; and conservation and sustainable management of biodiversity. (Ministry of Agriculture and Forestry, 2018a). The Strategic Plan of the General Directorate of Forestry (2019-2023) aims to prevent soil erosion and reduce grazing pressure by carrying out rehabilitation activities in the rangelands in the forests, forest edges and upper tree lines, which are used as rangeland but cannot be transformed into forest areas (Ministry of Agriculture and Forestry, 2018b). Within the provisions of the III. Agriculture and Forestry Council (2019), there are topics regarding the determination, conservation, improvement and monitoring of natural resources and biodiversity, especially the sustainable management and implementation of agricultural fields and rangelands (Ministry of Agriculture and Forestry, 2019b).

Regional Plans and Programs

Southeastern Anatolia Project (GAP) Regional Development Administration, Eastern Anatolia Project (DAP) Regional Development Administration, Konya Plain Project (KOP) Regional Development Administration, and Eastern Black Sea Project (DOKAP) Regional Development Administration under the Ministry of Industry and Technology address the social and economic development of the regions with the regional development plans that they prepared. In addition, the regional plans prepared by the Development Agencies working under the Ministry of Industry and Technology contribute to reducing inter-regional inequalities and ensuring regional development.

Strategic plans and action plans prepared by the Regional Development Administrations and Regional plans prepared by the Development Agencies in the level regions including the steppe areas are as follows:

- GAP Regional Development Administration Strategic Plan (2019-2023) and GAP Action Plan (2014-2018)
- DAP Strategic Plan (2019-2023) and DAP Action Plan (2014-2018)
- KOP Strategic Plan (2019-2023) and KOP Action Plan (2014-2018)
- DOKAP Strategic Plan (2019-2023) and DOKAP Action Plan (2014-2019)
- Ahiler Development Agency, Ankara Development Agency, Dicle Development Agency, Eastern Anatolia Development Agency, Fırat Development Agency, İpekyolu Development Agency, Karacadağ Development Agency, Northeast Anatolia Development Agency, Mevlana Development Agency, Central Anatolia Development Agency, Serhat Development Agency “Regional Plans” (2014-2023)

In the plans of the Regional Development Administrations, the term “steppe” is not mentioned and there is no policy and measure directly related to steppe ecosystems. However, especially in the action plans that are currently out of date, terms of “meadow” and “rangeland” and the actions regarding the improvement of meadow-rangeland areas, sustainable use and management of rangelands are included.

- Under the strategies and plans prepared by the GAP Regional Development Administration; eco-friendly and innovative agricultural practices, including organic and good agriculture, sustainable animal husbandry practices, effective and productive use of natural resources, rural development supports in agricultural, non-agricultural, animal husbandry and non-irrigation fields, and tourism practices pursuing the balance

between protection-use come to the forefront (GAP Regional Development Administration, 2014; Ministry of Industry and Technology 2019a).

- In the strategies and plans prepared by the DAP Regional Development Administration; increasing agricultural production and added value and developing certain production and service sectors considering environmental sustainability are the aims that stand out. Project supports for the improvement of meadow-rangeland areas and growing forage crops are included (DAP Regional Development Administration, 2014; Ministry of Industry and Technology 2019b).
- In the strategies and plans prepared by the KOP Regional Development Administration; supporting infrastructure projects to increase efficiency in irrigation and productivity in agricultural production, carrying out the projects to increase the welfare level of low-income segments, disseminating modern techniques to increase added value in crop production and developing animal husbandry infrastructure are prominent. Rangeland improvement areas are supported (KOP Regional Development Administration, 2014; Ministry of Industry and Technology 2019c).
- In the strategies and plans prepared by the DOKAP Regional Development Administration; development of the agriculture and tourism sector in the region is stressed. The DOKAP action plan, that is currently out of date, includes aims such as determining the biodiversity, grass quality and quantity of the rangelands in the region, the improvement need for rangelands, as well as implementing improvement programs and ensuring their sustainable management, and diversifying forage crop production for roughage need (DOKAP Regional Development Administration, 2014; Ministry of Industry and Technology 2019d).

In the regional plans prepared by the Development Agencies, the term “steppe” is rarely mentioned in the texts introducing the region. While many plans include priorities and measures related to the conservation of biodiversity and sensitive ecosystems, there is no such a specific priority or measure for steppe biodiversity. On the other hand, meadows and rangelands becomes prominent in the regional plans, and almost all plans include priorities and measures for the improvement of meadow-rangeland areas, sustainable use and management of rangelands.

2.8.2. Institutional Structure and Capacity in the Conservation and Management of the Steppes

In Turkey, there is no institutional structure authorized and responsible for the management of steppe ecosystems. The steppe ecosystems comprise of natural steppes, meadows,

rangelands and degraded forests of steppic nature and are managed by the authorities and responsibilities of different institutions under different laws and regulations. The studies on conservation and management of steppes are mainly performed within two ministries, Ministry of Agriculture and Forestry and Ministry of Environment and Urbanization. These studies are carried out by various general directorates and affiliated provincial organizations within these institutions.

The General Directorate of Nature Conservation and National Parks (GDNCNP) (Ministry of Agriculture and Forestry) and the Regional Directorates NCNP Departments, are responsible for inventory, research, conservation, planning and management, rehabilitation, restoration and monitoring activities related to biodiversity and protected areas as well as regulation of hunting on land, operation and control of hunting resources. It is a key institution in terms of conservation and sustainable management of steppe biodiversity, creation and management of protected areas representing the steppes. In order to take the inventory of biodiversity in Turkey and to monitor the species and habitats that determine the change in ecosystem dynamics, the inventory and monitoring studies carried out in 81 provinces provide an important base for determining and recording steppe biodiversity. Even though there is no protected area status special for steppes, steppe ecosystems are included in existing protected areas such as National Park, Natural Park, Natural Monument, Nature Reserve Area, Wetland of National Importance, Wetland of Local Importance, Wildlife Reserve. Inclusion of potential steppe areas in protected areas and protection of steppe species and habitats within existing protected areas, preparation, implementation and monitoring of species action plans for steppe species are of great importance.

The General Directorate of Forestry (Ministry of Agriculture and Forestry) and the Regional Directorates, carry out rehabilitation measures for glades located in forests, forest edges, and upper tree lines and also in rangelands, summer pastures, winter pastures and grasslands located in the areas where afforestation, soil conservation, basin improvement activities will be carried out. The general directorate is responsible for the conservation, care and improvement of rangelands, summer pastures, winter pastures and grasslands in the forest, forest edge and upper tree line of the forest, which are used as rangeland but cannot be converted into forest areas. In these areas, rangeland improvement studies with cultural and technical measures (fertilization, artificial insemination, erosion control etc.) are carried out as well as the regulation and planning of grazing. These studies give GDF responsibility for in-forest rangelands, i.e., steppe areas.

The General Directorate of Plant Production (GDPP), the General Directorate of Livestock (GDL), the General Directorate of Agricultural Reform (GDAR), the Agriculture and Rural

Development Support Institution (ARDSI), the General Directorate of Agricultural Research and Policies (GDARP), and the General Directorate of Agricultural Enterprises (GDAE) under the Ministry of Agriculture and Forestry are the authorized institutions for the sustainable management of natural resources offered by steppe ecosystems used as agricultural fields and rangeland areas.

The duties of the **GDPP under the Ministry of Agriculture and Forestry** include increasing the plant production, its productivity, and plant diversity, developing and disseminating organic agriculture and good agricultural practices, popularizing the conscious use of fertilizers based on soil analysis, determination and development of agricultural basins, establishing basin-based production policies, conducting research on water, soil, environment, climate change, cultivation techniques, harvest and storage, and providing improvement and conservation of meadows, rangelands and pastures.

In this context, the GDPP Department of Meadow-Rangeland and Forage Crops and the Department of Good Agricultural Practices and Organic Agriculture conduct studies that directly contribute to steppe ecosystems. The Department of Meadow-Rangeland and Forage Crops works on the determination, restriction and allocation of rangelands, summer pastures, winter pastures, general grasslands and meadows, increasing the production of perennial forage crops and establishing sown rangelands. The authority to carry out activities related to rangeland studies has been given to the Ministry of Agriculture and Forestry and to the Provincial Rangeland Commissions in the provinces. The Rangeland Improvement and Management Projects are carried out together with the cooperation of Ministry of Agriculture and Forestry, Universities and Research Institutes. In addition, for villagers and shepherds, the training and extension activities are carried out. The Rangeland Information System (RIS) provides an important system in which rangeland areas are recorded, viewed and monitored via satellite images.

The supports provided within the scope of the Environmentally Based Agricultural Land Protection Program (EBALP) managed by the GDPP constitute a model for the generalization of eco-friendly agricultural practices. Such practices support the steppe creatures that use agricultural fields and contribute to reducing the pressure of intensive farming practices on the surrounding natural steppe areas.

Among the duties of the **GDL**, improvement of animal husbandry and livestock production, dissemination of high-quality animal breeds, implementation of animal production with methods that protect human health and the ecological balance, implementation of livestock improvement programs, and the marketing of animal products take place. In order to reduce

the grazing pressure on the rangelands, supporting animal breeding in keeping with the quality of the rangeland, performing rotational grazing by determining the grazing capacity, and creating subsidies models for the sustainable management of rangelands, are important for the conservation and sustainable management of the steppes used as rangeland.

The **GDAR** is responsible for taking the necessary measures to protect agricultural lands and ensure their proper use, performing processes of the land and soil survey, classification and mapping, preparing land use plans for agricultural purposes or having them prepared, managing agricultural product planning and support, increasing productivity in agricultural irrigation, ensuring the use of proper irrigation techniques, working on global climate change, drought, desertification or ensuring others work on them.

Sustainable land management and climate-smart agriculture practices, conservation of agricultural biodiversity and increasing the adaptation capacity to climate change in agricultural practices implemented within the scope of the Strategy and Action Plan to Combat against Drought (2018-2022) under the coordination of the Agricultural Drought Management Coordination Board, whose secretariat and coordination are conducted by the GDAR, are important studies (Gıda, Tarım ve Hayvancılık Bakanlığı, 2018). Determining the agricultural support framework, priority issues and support items and the amount, and directing agricultural supports within the Agricultural Support and Steering Board, whose secretariat and coordination are conducted by the GDAR Department of Agricultural Supports, offer opportunities for conservation of steppe biodiversity.

The Instrument for Pre-Accession Assistance for Rural Development (IPARD) is implemented by the **ARDSI** in order to compensate for the income losses arising from the producer's commitments to protect the environment and natural resources. With the Agriculture-Environment Measures within the scope of the program, it is aimed for farmers to adopt more eco-friendly and sustainable practices that can support the conservation of soil, underground waters, surface waters, biodiversity and agricultural fields with high natural value. It provides an important opportunity for economically supporting the rural population in steppe areas and promoting economic activities and production methods suitable for these areas. In this context, a support scheme is being developed to support bustard (*Otis tarda*) friendly agricultural practices, which is a threatened steppe bird in selected agricultural fields in Polatlı, Ankara.

The **GDARP and its affiliated Research Institutes** are responsible for preparing and managing research projects on agricultural field, vineyards-orchards, meadow-rangeland and forage crop production resources, biodiversity and genetic resources, effective use of soil and water

resources, soil moisture conservation, biological fertilizer, biological combating, land degradation, erosion, drought and climate change.

Konya Soil Water and Combating Desertification Research Institute works on the conservation of natural resources, biodiversity, and determining the plant species resistant to semi-arid areas. Bahri Dağdaş International Agricultural Research Institute and Drought Test Centre conducts research on cereals, cash crops, edible legumes, medicinal and aromatic plants, meadow-rangeland and forage crops, fruit growing, vegetable growing, biodiversity, genetic resources and animal husbandry. Aegean Agricultural Research Institute (AARI) and Field Crops Central Research Institute are the leading institutes responsible for the conservation (generally *ex-situ*) and management of plant genetic diversity. The National Genebank, Turkey Seed Genebank and a herbarium were established within these institutes. These studies contribute to the conservation and sustainable use of steppe biodiversity and gene resources.

The **GDAE** is responsible for transferring the seeds, saplings, seedlings and similar goods that it grows, which can adapt to climate change, and the breeding animals and sperms it produces, to the breeders in order to increase and diversify the production of crops and animals and to improve the product quality. In agricultural practices to be carried out in enterprises where steppe ecosystems and related species live, it is important to promote the breeding of local plant and animal species, supporting dry farming practices, to implement eco-friendly practices and to protect natural and semi-natural steppe ecosystems.

The **General Directorate of Combating Desertification and Erosion (GDCDE)**, the **General Directorate of State Hydraulic Works (GDSHW)**, the **General Directorate of Water Management (GDWM)**, and the **General Directorate of Meteorology (GDM)** under the Ministry of Agriculture and Forestry are also other relevant institutions that have direct and indirect plans and programs for the conservation of steppe ecosystems. The **Department of Education and Publishing (Ministry of Agriculture and Forestry)** will make a significant contribution to in-service and non-public agricultural training and extension activities by observing the biodiversity values of the steppes and sustainable resource use and including training programs.

The **Ministry of Environment and Urbanization and the Provincial Directorates of Environment and Urbanization** are the main institutions responsible for high level planning, in addition to many other roles. The General Directorate of Spatial Planning has an important position in this regard. In this context, the institution is currently preparing landscaping plans and integrated coastal areas plans and the Spatial Strategy Plan preparation studies which will bring a higher level planning perspective into practice in the near future continue. The General

Directorate of Environmental Management for preventing environmental pollution and adapting to climate change; and the General Directorate for Protection of Natural Assets for registration, approval and announcement of protected areas and especially for the determination, registration and approval of Special Environmental Protection Areas and natural SITES under its authority, and biodiversity, habitat and management planning in these areas are important for the steppe ecosystems with their powers and responsibilities.

The **Ministry of National Education** for non-formal and formal education; The **Ministry of Industry and Technology** for including priorities regarding steppes in regional plans and programs and allocating financial resources; **Academic Institutions** for human resource, research and technology development; Chambers of Agriculture, Producer Organizations and Producer Unions, **Non-Governmental Organizations** (especially those working on nature conservation) for adopting nature conservation and sustainable resource use, making implementations, and dissemination; and **Private Sector** for implementation and financial support are important stakeholders in terms of conservation and sustainable management of steppes.

The **Local Administrations** for planning and management authority at the local level and supporting agricultural and rural services that take into account sustainable resource use. With the "Law No. 6360 on the Establishment of Metropolitan Municipalities and Twenty-seven Districts in Fourteen Provinces and Amendments to Certain Laws and Decree Laws", which was adopted on 06.12.2012 and whose names and some articles were changed with the Law No. 6447 of 14.03.2013 Metropolitan municipalities have been established in Aydın, Balıkesir, Denizli, Hatay, Malatya, Manisa, Kahramanmaraş, Mardin, Muğla, Tekirdağ, Trabzon, Şanlıurfa, Van and Ordu provinces with a total population of over 750,000. The borders of Adana, Ankara, Antalya, Bursa, Diyarbakır, Eskişehir, Erzurum, Gaziantep, İzmir, Kayseri, Konya, Mersin, Sakarya and Samsun metropolitan municipalities have been extended to the provincial administrative borders. The legal personality of the special provincial administrations of the 28 provinces mentioned above and the provinces of Istanbul and Kocaeli have been abolished. In addition, the legal entities of village and town municipalities in these provinces were abolished and attached to the municipality of the district they are affiliated to. In this case, the metropolitan municipality administration shows an expansion from city administration to area management. Along with this situation, Local Authorities together with the Ministry of Environment and Urbanization have an important authority in reducing the pressure created by the construction on agricultural areas, rangelands and forests and preventing the misuse of these areas. New measures should be taken in order to protect rangelands, highlands, winter pastures and public pastures and meadows from

construction pressure, especially after the extension of the metropolitan municipality boundaries to the provincial borders.

Although there is no single institutional structure responsible for conservation and management of the steppes, there is the capacity and various mechanisms within different institutions. In this case, institutional cooperation becomes even more important for conservation and management of steppes. In addition, in order to prevent overlapping and ensure coordination in the works of these institutions, this capacity should be increased, and the works should be made more effective through information sharing and coordination. In this direction, the institutional structuring under different strategic purposes, capacity increase and coordination should be prioritized. Moreover, in the governance section, suggestions for the establishment of a governance structure that can enable more effective work are presented.

2.8.3. Assessment of Legislation and Institutional Responsibilities on the Conservation and Management of Steppes

In this part of the strategy and action plan, laws and regulations related to the conservation and management of the steppes as well as the duties and responsibilities of key institutions in this field are included. DKM experts made different evaluations in this context. Firstly, a scheme regarding the central and local level institutional structure has been prepared (

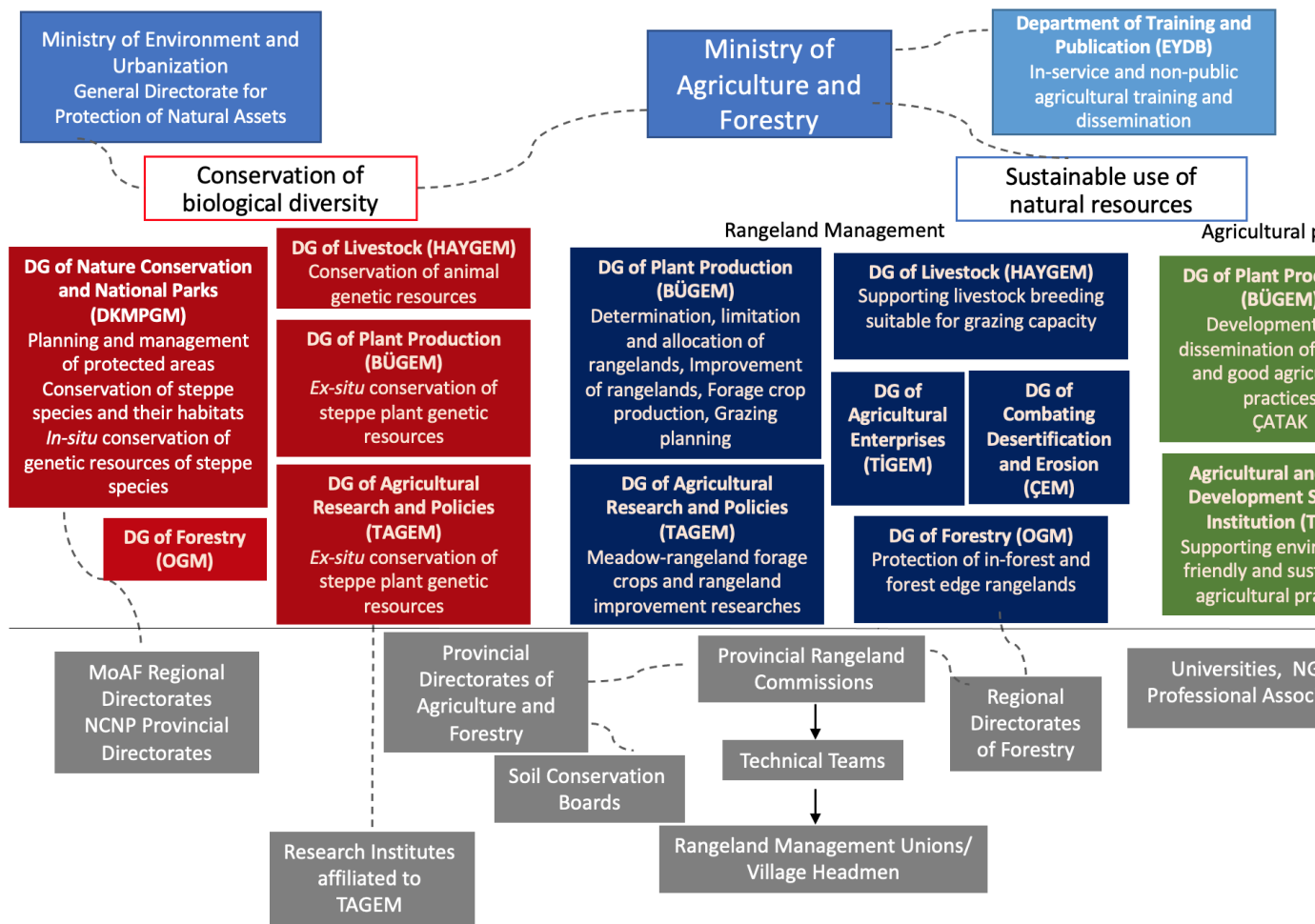


Figure 11). Secondly, by examining together the legislation and the duties and responsibilities of institutions, the overlaps and gaps in key issues related to the conservation and management of the steppes have been revealed. In Table 5, prepared for this purpose, the legislation and institutional responsibilities have been evaluated in two different axes under the key topics related to the conservation and management of the steppes. The evaluation made in terms of laws and regulations is shown in the main axis of the table. For the sections, the cells with relevant legislation are shown with green color. In addition, the institutional responsibilities under different topics are specified in the bottom column of the table. The evaluation of the duties and responsibilities of institutions is based on the evaluation results of the survey study conducted with participating institutions in the First National Steppe Conservation Workshop held in Şanlıurfa on December 2-3, 2019 within the scope of the Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project. In the study in question, the extent of overlapping duties and responsibilities of different institutions and the importance of cooperation for the sustainable management of the steppes have emerged. The results of this evaluation, in which 90 experts from the First National Steppe Conservation Workshop participated, are included in Annex 2.

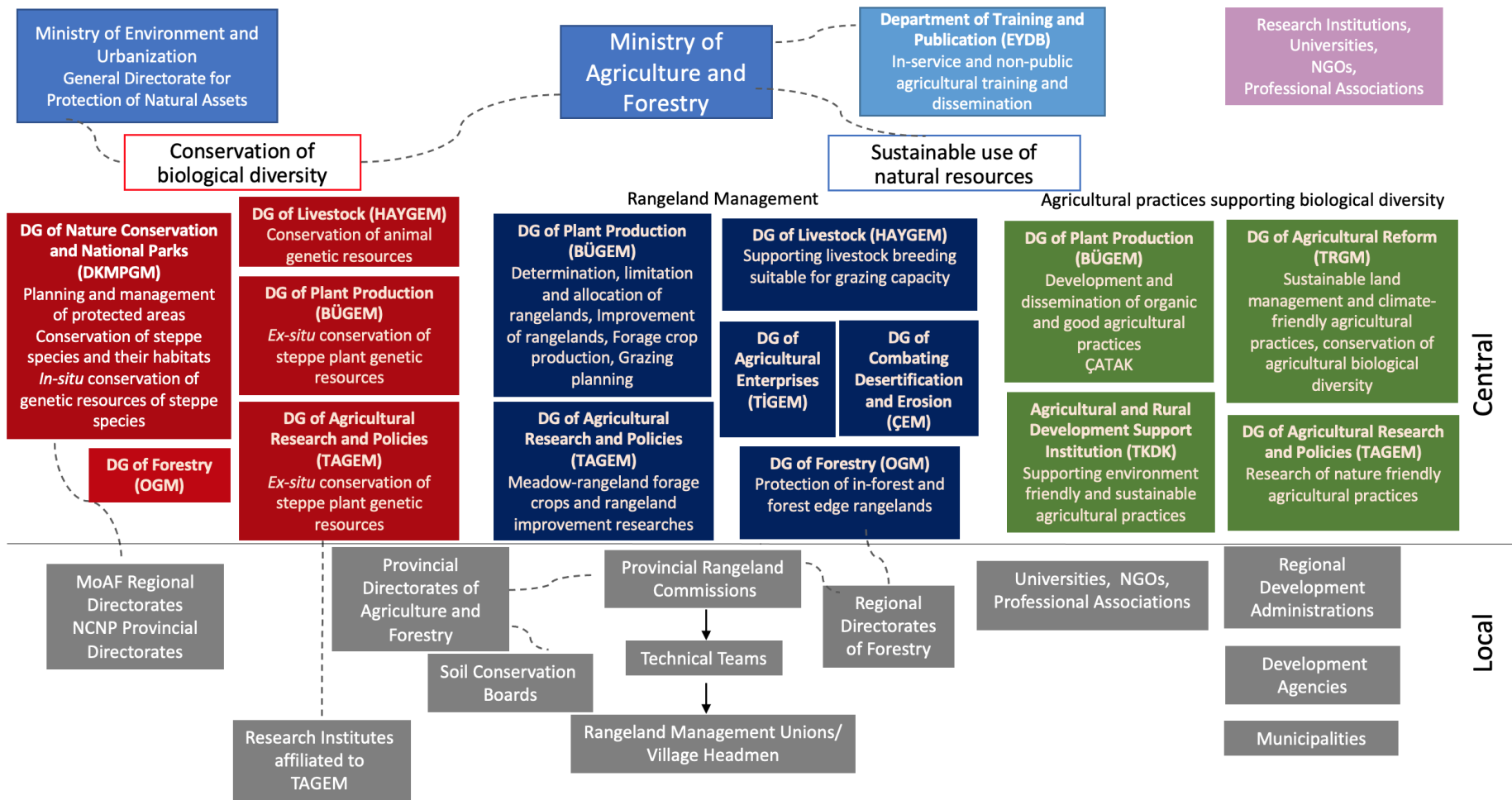


Figure 11. Institutional structure scheme ©DKM

Table 5. Assessment of Legislation and Institutional Responsibilities on the Conservation and Management of Steppes

		LEGISLATION ON THE CONSERVATION AND MANAGEMENT OF STEPPES																										INSTITUTIONS						
SUBJECT HEADINGS		Pasture Law	Regulation on Pasture	Forest Law	Forest Management Regulation	National Afforestation and Erosion Control Mobilization Law	Regulation on Afforestation	Reg. on Forest Services on Afforestation and Erosion Control	Environment Law	National Parks Law	Land Hunting Law	Cultural and Natural Heritage Prot. Act	Wetland Conservation Regulation	Reg. on Proc. and Prin. of Determ., Registr. and Approval of Protected Areas	Agriculture Law	Agricultural Basins Regulation	Reg. on Good Agricultural Practices	Soil Pres. and Land Util. Law and Amend.	Regulation on the Conservation, Use and Planning of Agricultural Land	Regulation on Supporting Producers Who Prefer EBALP Program	Organic Farming Law and Reg. on the Princi. and Applic. of Organic Farming	Agrarian Reform Act for Land Arrangements in Irrigation Areas	Applic. Reg. on Land Consolidation and On-Farm Development Services	By-Law on Prot. of Water Basins and Preparation of Management Plans	Biosafety Law	Veterinary Services, Plant Health, Food and Feed Law	Seed Law	Regulation on Removal, Production and Trade of Natural Flower Bulbs	Reg. on the Collection, Preservation and Use of Plant Genetic Resources	Regulation on Conservation of Animal Genetic Resources				
Conservation of important species*																																		*GDNCNP **GDF-GDARP-GDPP-GDL
Conservation of plant gene resources*																																		*GDARP-GDPP **GDNCNP-GDF-GDL
Conservation of animal gene resources																																		*GDARP-GDNCNP-GDL (livestock) **GDPP-GDF
Conservation of vegetation																																		*GDNCNP-GDPP-GDF **GDARP-GDL
Conservation of in-forest /forest-edge																																		*GDF **GDPP-GDNCNP-GDARP-GDL

LEGISLATION ON THE CONSERVATION AND MANAGEMENT OF STEPPES

	LEGISLATION ON THE CONSERVATION AND MANAGEMENT OF STEPPES																				INSTITUTIONS											
SUBJECT HEADINGS	Pasture Law	Regulation on Pasture	Forest Law	Forest Management Regulation	National Afforestation and Erosion Control Mobilization Law	Regulation on Afforestation	Reg. on Forest Services on Afforestation and Erosion Control	Environment Law	National Parks Law	Land Hunting Law	Cultural and Natural Heritage Prot. Act	Wetland Conservation Regulation	Reg. on Proc. and Prin. of Determ., Registr. and Approval of Protected Areas	Agriculture Law	Agricultural Basins Regulation	Reg. on Good Agricultural Practices	Soil Pres. and Land Util. Law and Amend.	Regulation on the Conservation, Use and Planning of Agricultural Land	Regulation on Supporting Producers Who Prefer EBALP Program	Organic Farming Law and Reg. on the Princi. and Applic. of Organic Farming	Agrarian Reform Act for Land Arrangements in Irrigation Areas	Applic. Reg. on Land Consolidation and On-Farm Development Services	By-Law on Prot. of Water Basins and Preparation of Management Plans	Biosafety Law	Veterinary Services, Plant Health, Food and Feed Law	Seed Law	Regulation on Removal, Production and Trade of Natural Flower Bulbs	Reg. on the Collection, Preservation and Use of Plant Genetic Resources	Regulation on Conservation of Animal Genetic Resources	INSTITUTIONS		
Implementation of the improvement and reclamation of steppe or rangelands																																*GDPP- GDNCNP- GDCDE ** GDARP- GDF-GDL
Agricultural practices supporting biodiversity																																* GDPP-GDAR- ARDSI ** GDARP- GDNCNP (protected areas)

**It is important to separate the conservation of important species and the conservation of plant genetic resources into in-situ and ex-situ and to define corporate responsibilities within this framework. There is more need for cooperation on these issues.*

***Preservation of plant species composition is given under two different headings – forage crop diversity and species diversity - for the evaluation of duties and responsibilities separately. Nevertheless, there is need for cooperation due to overlap in institutional powers in important areas for both forage crop diversity and biodiversity.*

3. The Spatial Assessments Regarding the Steppes of Turkey

3.1. Current situation: The Conservation and Management of the Steppes

As detailed in the Section 2.3. of the Strategy, the region, which includes the potential steppe and steppe forest (areas with sparse or dense forest in ecological regions dominated by steppes) ecosystems in Turkey, covers an area of approximately 33.5 million hectares. According to the current analyses made by Nature Conservation Centre, the potential steppe zone includes approximately 17 million ha of steppe area and 552,334 ha of steppe forest.

As for the distribution of steppe areas according to the geographical regions of Turkey, of total of the steppes and steppe forests (17.5 million ha), 42% is in Central Anatolia, 36% is in Eastern Anatolia, 14% is in Southeastern Anatolia, 5% is in the Black Sea region, 2% is in the Mediterranean region and 1% is in the Aegean Region (Table 6).

Table 6. Distribution of the steppe areas and steppe forests by the geographical regions

Geographical Region Name	Steppe area (ha)	Steppe forest (ha)	Ratio (%)*
Central Anatolia	7,100,719	286,857	42
Eastern Anatolia	6,240,417	87,486	36
Southeastern Anatolia	2,401,139	10,283	14
Black Sea	760,401	165,339	5
Mediterranean	320,070	1,028	2
Aegean	208,136	1,341	1

* The ratio shows the distribution of the steppe areas and steppe forests by the geographical regions.

Secondly, for each province, the size of the area covered by the steppe areas within the borders of the potential steppe zone and their ratio to the provincial area have been assessed. When the steppes that cover the largest area on a provincial basis are considered, it has been determined that especially Sivas, Konya, Van and Erzurum host steppe vegetation in the large areas (total steppe areas in these provinces are respectively 1,539,635 ha, 1,355,367 ha, 1,282,438 ha, 1,041,766 ha; Table 7,



Figure 12). The provinces with the highest ratio of areas with steppe vegetation to the provincial area are Iğdır (70%), Bayburt (63%) and Ağrı (61%).



Figure 12. Distribution of the steppe areas and steppe forests within the potential steppe zone ©DKM

Table 7. Distribution of the steppe area, steppe forest area, registered rangeland area, agricultural fields, number of livestock and population data in the provinces within the potential steppe zone.

Province Name ⁺	Geographic Region Name	Area (ha)	Area in potential steppe zone (ha)	Intersection with the potential steppe zone (%)*	Steppe region (ha)	Steppe forest (ha)	Ratio of the steppe area in the province (%)**	Ratio of steppe forest in the province (%)**	Area of registered rangeland (ha)***	Area of agricultural fields (ha)****	Number of bovine	Number of ovine	Population
Sivas	Central Anatolia	2,854,651	2,351,212	82	1,539,635	36,217	54	1	670,039	728,624	357,866	578,436	646,608
Konya	Central Anatolia	4,078,657	3,515,033	86	1,355,367	49,732	33	1	563,926	1,873,503	921,572	2,252,461	2,205,609
Van	Eastern Anatolia	2,113,101	1,835,381	87	1,282,438	314	61	0.01	1,024,791	310,940	177,346	2,650,531	1,123,784
Erzurum	Eastern Anatolia	2,523,960	1,614,397	64	1,041,766	30,746	41	1	503,642	512,572	768,997	746,733	767,848
Kayseri	Central Anatolia	1,693,642	1,518,418	90	799,554	6,999	47	0.41	341,370	647,254	349,696	647,093	1,389,680
Ankara	Central Anatolia	2,546,883	2,185,546	86	775,040	64,342	30	3	103,533	1,158,225	538,755	1,581,795	5,503,985
Şanlıurfa	Southeastern Anatolia	1,941,343	1,939,577	100	761,688	1,714	39	0.09	273,654	1,100,575	352,084	2,148,664	2,035,809
Malatya	Eastern Anatolia	1,240,080	1,090,465	88	745,089	16,161	60	1	135,486	295,551	174,321	338,433	797,036
Ağrı	Eastern Anatolia	1,156,208	1,148,918	99	710,892	2,687	61	0.23	16,023	393,019	388,452	1,322,805	539,657
Diyarbakır	Southeastern Anatolia	1,539,831	1,395,031	91	680,733	7,558	44	0.49	121,448	658,314	589,462	1,834,639	1,732,396
Erzincan	Eastern Anatolia	1,172,606	770,241	66	581,876	21,179	50	2	215,999	149,071	114,915	434,457	236,034
Mardin	Southeastern Anatolia	874,263	873,868	100	535,602	9	61	0.00	36,558	322,137	116,825	975,482	829,195

Province Name +	Geographic Region Name	Area (ha)	Area in potential steppe zone (ha)	Intersection with the potential steppe zone (%)*	Steppe region (ha)	Steppe forest (ha)	Ratio of the steppe area in the province (%)**	Ratio of steppe forest in the province (%)**	Area of registered rangeland (ha)***	Area of agricultural fields (ha)****	Number of bovine	Number of ovine	Population
Kars	Eastern Anatolia	1,029,913	953,79	93	498,964	4,729	48	0.46	54,091	420,362	450,101	456,500	288,878
Elazığ	Eastern Anatolia	932,036	741,129	80	483,141	3,666	52	0.39	67,117	184,503	187,418	698,745	595,638
Niğde	Central Anatolia	703,916	645,637	92	399,871	1,707	57	0.24	120,236	230,149	172,477	572,969	364,707
Karaman	Central Anatolia	883,838	606,054	69	389,134	627	44	0.07	145,010	210,920	68,266	662,853	251,913
Yozgat	Central Anatolia	1,343,228	1,202,100	89	357,009	73,961	27	6	72,993	747,419	247,809	378,798	424,981
Eskişehir	Central Anatolia	1,411,628	835,248	59	327,543	3,337	23	0.24	135,004	470,619	155,273	800,732	871,187
Aksaray	Central Anatolia	778,835	778,835	100	267,922	1,214	34	0.16	140,285	404,889	266,483	678,635	412,172
Kahramanmaraş	Mediterranean	1,431,759	422,339	29	267,312	543	19	0.04	131,058	143,372	215,223	837,589	1,144,851
Çankırı	Central Anatolia	749,580	474,404	63	260,143	32,725	35	4	93,015	175,348	151,099	129,203	216,362
Iğdır	Eastern Anatolia	365,994	364,312	100	257,168	84	70	0.02	81,469	95,863	150,633	1,028,322	197,456
Çorum	Black Sea	1,260,589	771,937	61	246,264	89,516	20	7	36,292	415,713	241,485	234,412	536,483
Bayburt	Black Sea	381,831	372,526	98	239,204	13,008	63	3	76,606	112,213	98,060	48,787	82,274
Ardahan	Eastern Anatolia	502,538	384,626	77	237,273	6,806	47	1	150,949	121,383	306,925	74,238	98,907
Kırşehir	Central Anatolia	665,495	665,495	100	235,120	6,549	35	1	70,404	381,718	223,145	277,170	241,868

Province Name ⁺	Geographic Region Name	Area (ha)	Area in potential steppe zone (ha)	Intersection with the potential steppe zone (%)*	Steppe region (ha)	Steppe forest (ha)	Ratio of the steppe area in the province (%)**	Ratio of steppe forest in the province (%)**	Area of registered rangeland (ha)***	Area of agricultural fields (ha)****	Number of bovine	Number of ovine	Population
Batman	Southeastern Anatolia	452,975	355,656	79	220,466	0	49	0	19,82	118,150	107,784	820,155	599,103
Afyonkarahisar	Aegean	1,397,484	490,555	35	208,136	1,341	15	0.10	18,352	244,027	391,507	949,973	725,568
Kırıkkale	Central Anatolia	487,683	487,683	100	199,762	8,892	41	2	43,053	260,501	73,216	135,102	286,602
Nevşehir	Central Anatolia	557,884	557,884	100	194,620	556	35	0.10	71,675	346,073	90,683	145,970	298,339
Hakkari	Eastern Anatolia	730,845	186,916	26	153,507	0	21	0	62,813	26,432	44,443	668,041	286,470
Gümüşhane	Black Sea	666,191	289,110	43	153,205	42,896	23	6	23,291	82,449	82,202	37,339	162,748
Şırnak	Eastern Anatolia	724,034	176,983	24	120,461	0	17	0	10,972	52,819	71,120	1,138,629	524,190
Siirt	Southeastern Anatolia	574,490	143,034	25	92,439	23	16	0.00	15,834	49,739	34,918	1,250,453	331,670
Adıyaman	Southeastern Anatolia	732,367	284,872	39	69,445	978	9	0.13	18,856	162,030	129,194	343,577	624,513
Muş	Eastern Anatolia	880,178	210,338	24	62,447	9	7	0.00	3,041	139,317	306,542	1,041,102	407,992
Tokat	Black Sea	989,639	142,446	14	50,333	10,638	5	1	8,600	76,820	310,431	390,190	612,646
Tunceli	Eastern Anatolia	770,334	86,320	11	44,107	0	6	0	3,740	19,316	33,939	368,089	88,198
Giresun	Black Sea	704,641	60,987	9	35,512	7,817	5	1	4,977	15,608	112,481	106,101	453,912
Gaziantep	Southeastern Anatolia	681,469	197,564	29	33,541	0	5	0	9,714	155,290	271,879	625,949	2,028,563
Artvin	Black Sea	756,612	28,890	4	27,392	557	4	0.07	14,467	777	61,174	129,794	174,010

Province Name ⁺	Geographic Region Name	Area (ha)	Area in potential steppe zone (ha)	Intersection with the potential steppe zone (%) [*]	Steppe region (ha)	Steppe forest (ha)	Ratio of the steppe area in the province (%) ^{**}	Ratio of steppe forest in the province (%) ^{**}	Area of registered rangeland (ha) ^{***}	Area of agricultural fields (ha) ^{****}	Number of bovine	Number of ovine	Population
Mersin	Mediterranean	1,593,008	26,807	2	26,770	0	2	0	4,892	273	115,473	1,370,420	1,814,468
Adana	Mediterranean	1,414,060	33,603	2	24,220	435	2	0.03	5,852	7,962	265,430	807,900	2,220,125
Bitlis	Eastern Anatolia	834,613	234,012	28	16,727	1,077	2	0.13	10,216	40,009	94,880	645,291	349,396
Rize	Black Sea	397,291	8,046	2	8,038	0	2	0	6,367	0	25,480	27,660	348,608
Kilis	Southeastern Anatolia	141,223	55,641	39	7,226	0	5	0	2,188	45,721	12,999	210,009	142,541
Bingöl	Eastern Anatolia	817,262	5,216	1	4,561	27	1	0.00	0	424	132,772	510,781	281,205
Total^{*****}		52,480,687	33,519,082	-	17,028,662	551,378	-	-	5,739,717	14,107,996	10,553,235	34,113,007	36,296,185

⁺ The table ranking was made according to the size of the steppe. The registered rangeland areas in the table are up-to-date as of April 2020, and the population and animal statistics data as of 2018

^{*} The provinces where the intersection of provincial area with the potential steppe zone is <50% is shown in gray. The provinces where the intersection is lower than 1% are not shown.

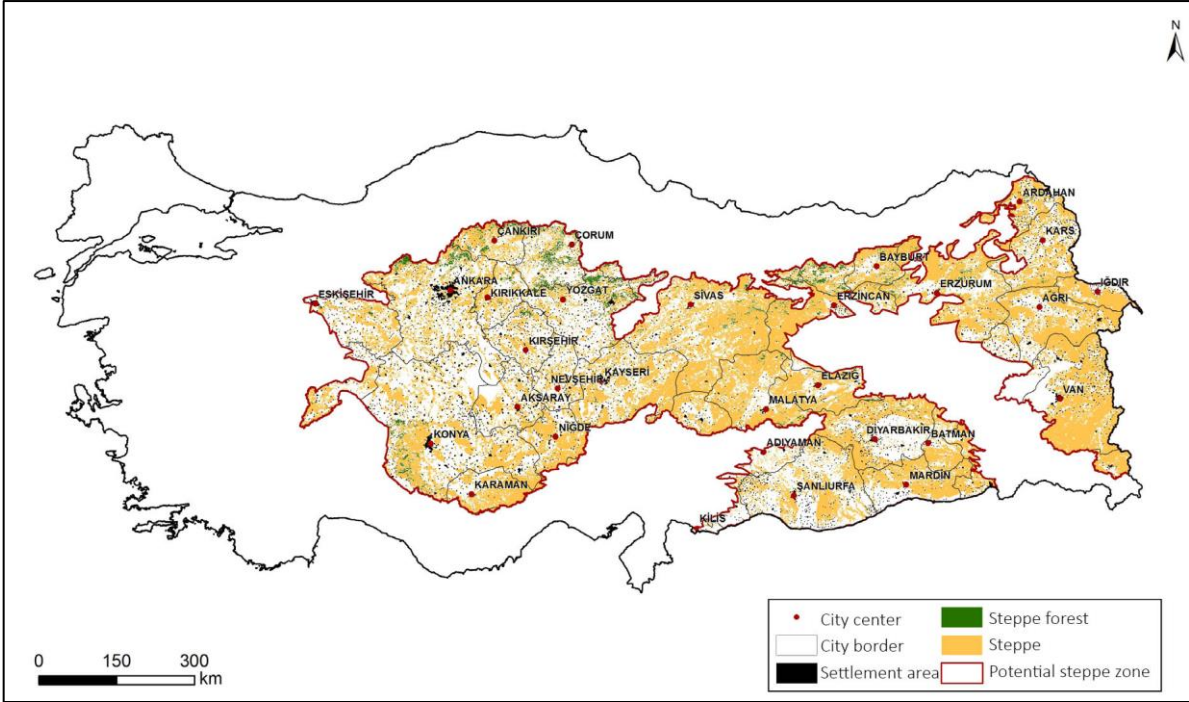
^{**} In this ratio, the entire provincial area is taken into consideration.

^{***} The area of the registered rangelands within the potential steppe zone in the province is given.

^{****} The area of the agricultural fields within the potential steppe zone in the province is given. Agricultural field information is taken from CORINE 2018 Land Use and Land Cover data (211,212,213,221,222,223,231,241,242,243,244 coded land classes). The methods applied to distinguish steppes and mixed agricultural fields are detailed in section 2.3. The lands that are not classified as steppe in these classes are considered as agricultural fields.

^{*****} In the table, the provinces with an intersection of more than 1% with the potential steppe zone are shown and the information of these provinces are included in the total.

Another factor taken into consideration in the assessment is the population density of the provinces dominated by steppe vegetation. The total population of the provinces with a large amount ($\geq 50\%$) of steppe areas is generally high and corresponds to approximately 29% of the population of Turkey (23.6 million). Among these provinces, Ankara, Konya and Şanlıurfa are the most densely populated provinces, whereas Bayburt, Ardahan and Iğdır are the provinces with the lowest population density (Table 7). It is expected that the pressure on the steppes will be more intense in the provinces where population is dense, and the settlement areas cover larger areas. According to CORINE 2018 Land Use and Land Cover data, the settlement areas within the potential steppe zone cover 411,947 ha area and correspond to 1.4% of the total area of the potential steppe zone (



Figure

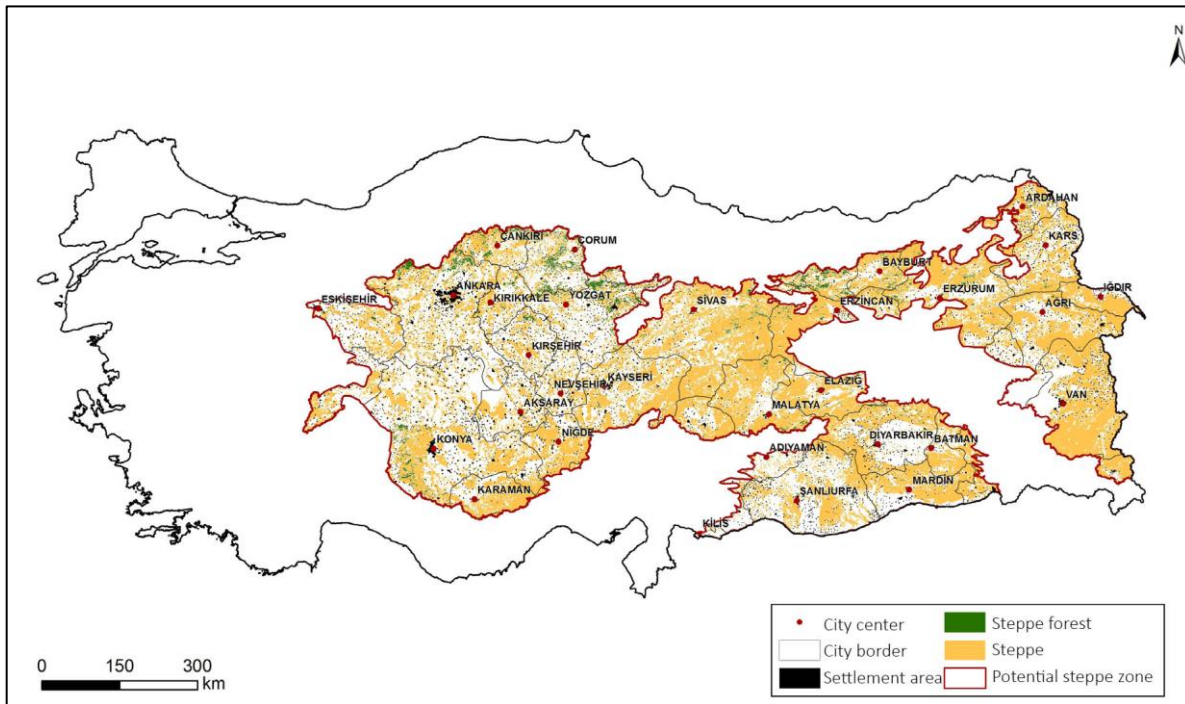


Figure 13). In this context, it can be said that the human-induced pressure on the steppes is high in the provinces of Ankara, Konya, Şanlıurfa, Diyarbakır, Kayseri and Van, which have both dense population and large steppe areas.

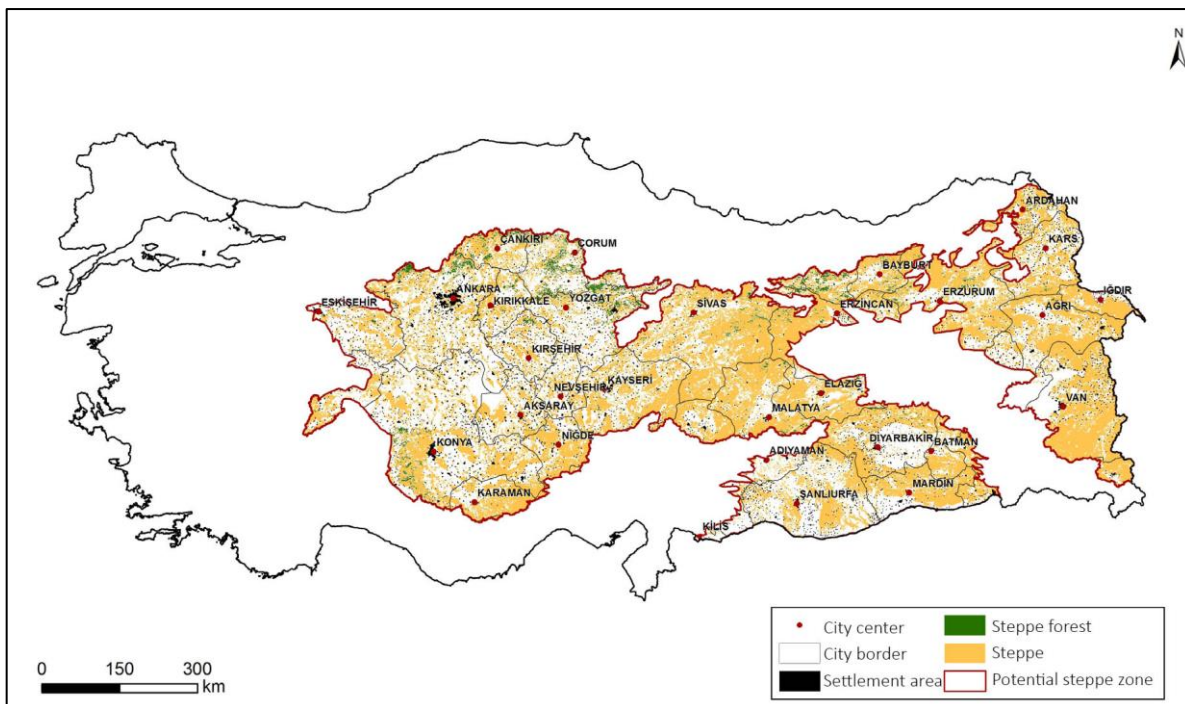


Figure 13. The settlement pressure on the steppe areas (17 million ha) within the potential steppe zone in Turkey. On this map, the settlement areas (411.947 ha) from the CORINE 2018 Land Use and Land Cover data are shown ©DKM

In addition to their biodiversity, steppes are also an economically important source of income for the local people, as they are used as rangeland for the animal husbandry activities. Across Turkey, the provinces where animal husbandry is most dense are located within the boundaries of the potential steppe zone. While the provinces with the highest number of livestock within the potential steppe zone are Konya, Van and Şanlıurfa (Figure 17, Table 7), the provinces where the registered rangelands cover the largest area are Van, Sivas and Konya (Figure 15, Table 7). Van and Konya, which have large rangelands compared to all provinces, stand out also with their high numbers of livestock. Registered rangelands within the potential steppe zone cover 5,739,717 ha.

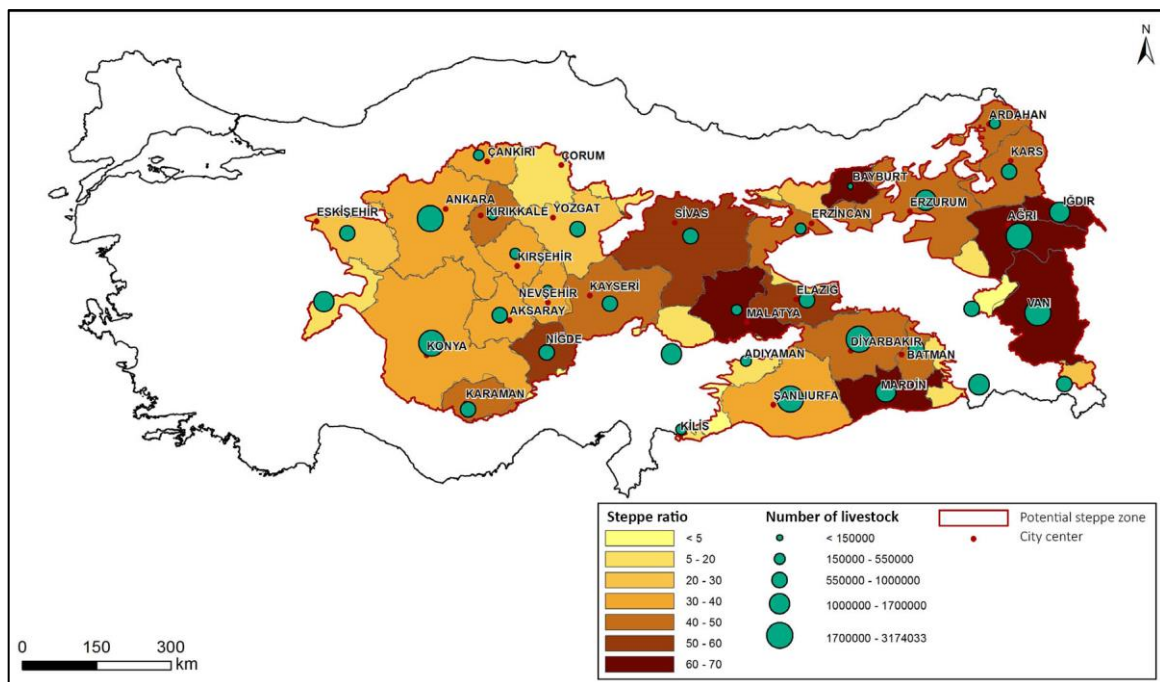


Figure 14. The ratio of steppe area and the number of livestock on provincial basis within the potential steppe zone in Turkey (TURKSTAT livestock statistics) ©DKM

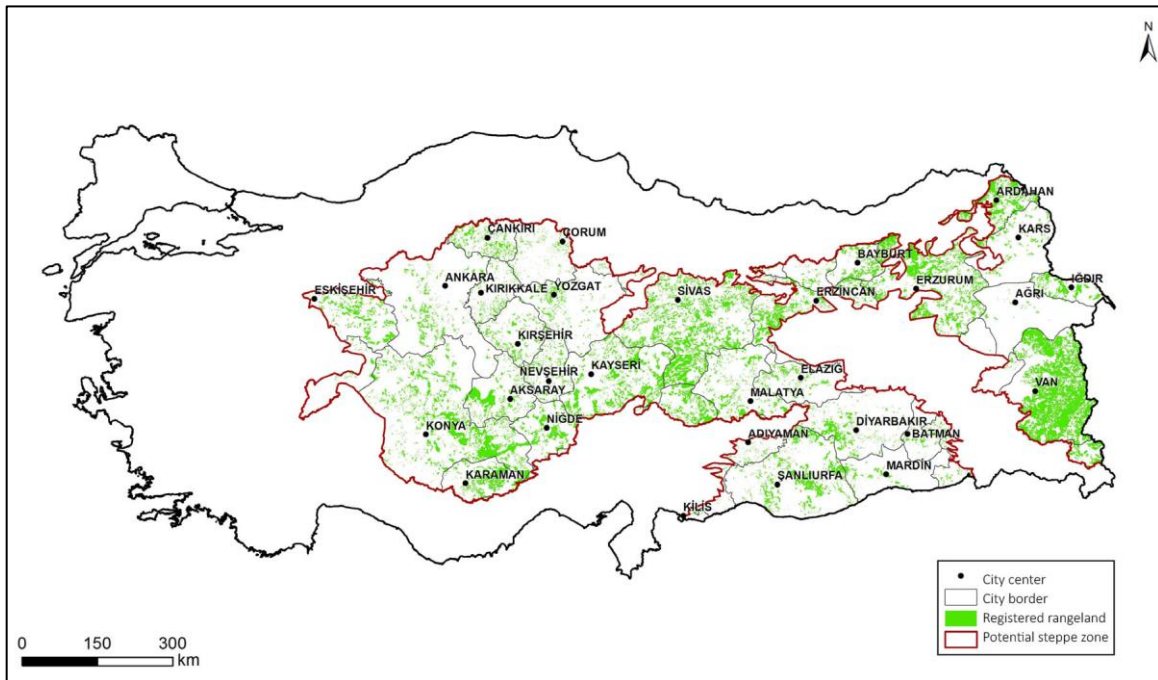


Figure 15. Distribution of the registered rangelands within the potential steppe zone in Turkey (Ministry of Agriculture and Forestry General Directorate of Plant Production) ©DKM

3.1.1. Protected Areas

Within the potential steppe zone, there are 119 protected areas with legal status, 15 National Parks, including 9 National Parks (NP), 6 Historical National Parks (HNP), 39 Wetlands with protection status, 2 Nature Reserve Areas (NRA), 19 Wildlife Reserves (WR), 10 Natural Monuments (NM), 32 Natural Parks (NP) and 3 Special Environmental Protection Areas (SEPA) (

Table 8, Figure 16). The protected areas in the zone cover a total area of 1,634,897 ha and this total area corresponds to 37% of the protected areas and 20% of the number of protected areas in Turkey. In other words, 5% of the potential steppe zone is under protection within the protected areas with legal status. Considering the representation of protected areas in the steppe areas, 4 % of the 17.5 million ha of steppe and steppe forest areas (694,200 ha) are protected with legal status.

Table 8. Numbers of the protected areas and the surface areas they cover

Protected area type	Potential steppe zone		Turkey		Ratio (%)	
	Number of protected areas	Area (ha)	Number of protected areas	Area (ha)	Number of protected areas	Area
National Park*	15	285,857	45	913,110	33	31
Wetlands	39	536,263	72	1,064,637	54	48
Nature Reserve Area	2	19,213	30	46,767	7	41
Wildlife Reserve	19	338,702	84	1,162,788	23	29
Natural Monument	10	_*	115	-	9	-
Natural Park	32	9,255	249	107,360	13	9
Special Environmental Protection Area	3	773,646	15	1,337,291	20	58
Total**	120	1,634,897	610	4,455,998	20	37

* All Natural Monuments are left blank because there is no data on size.

** Overlapping values are not included in the total for areas with more than one protected area status when calculating the total area.

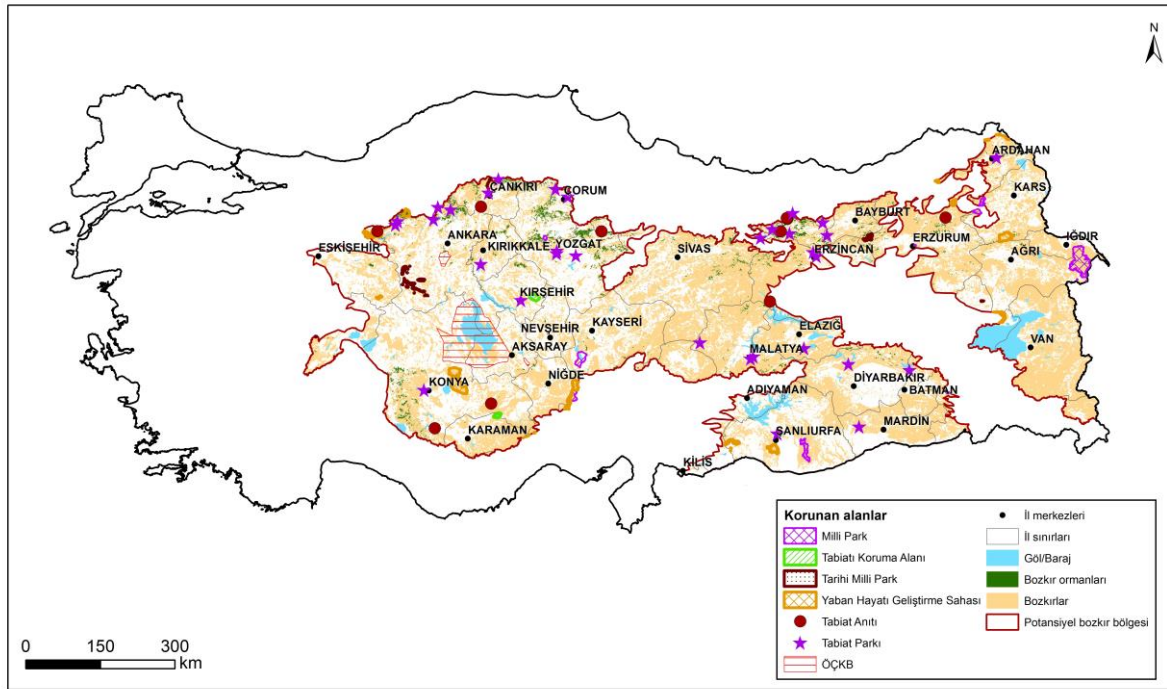


Figure 16. Protected areas with legal status within the potential steppe zone in Turkey ©DKM

The protected areas within the potential steppe zone in Turkey host different types of ecosystems such as wetlands, lakes, forests, and steppes. A separate study has been carried out to evaluate the representation of the steppe ecosystem in these protected areas. In this context, the density of the steppe vegetation in the protected areas within the potential steppe zone has been addressed. When assessed over the geographical regions, the protected areas in the Central Anatolia Region stand out with its steppe area of 295,936 ha (Table 9). Central Anatolia is followed by Eastern Anatolia and Southeastern Anatolia. As for the distribution of steppe vegetation in the protected areas, Ağrı Mountain NP, and Kars Sarıkamış Kağızman WR stand out in the Eastern Anatolia Region. In the Southeastern Anatolia Region, Tek Tek Mountains NP and Kızılkuyu WR, Karkamış Floodplain and Birecik WR, which are the habitat of the Arabian sand gazelles (*Gazella marica*), are the prominent protected areas in terms of the steppes. In the Central Anatolia Region, Salt Lake SEPA, Konya-Bozdağ WR which is an important area for Anatolian mouflon (*Ovis gmelinii anatolica*), Akşehir-Eber Lake Wetland with status, Niğde Çamardı WR and Aladağlar NP stand out with its steppe area (Table 9).

Table 9. The area covered by steppe vegetation in the protected areas

No	Protected Area Name	Type	Geographical Regions*	Area (ha)**
1	Salt Lake	SEPA	Central Anatolia	200,188
2	Ağrı Mountain	NP	Eastern Anatolia	87,523
3	Konya Bozdağ	WR	Central Anatolia	52,290
4	Akşehir, Eber Lake	Wetland with status	Central Anatolia	22,129
5	Kars Sarıkamış Kağızman	WR	Eastern Anatolia	19,185
6	Tek Tek Mountains	NP	Southeastern Anatolia	18,738
7	South Keban	Wetland with status	Eastern Anatolia	18,060
8	Bendimahı Delta	Wetland with status	Eastern Anatolia	17,504
9	Niğde Çamardı Demirkazık	WR	Central Anatolia	16,840
10	Doğubeyazıt Marshes	Wetland with status	Eastern Anatolia	15,610
11	Seyfe Lake	Wetland with status, RAMSAR	Central Anatolia	15,038

No	Protected Area Name	Type	Geographical Regions*	Area (ha)**
12	Hazar Lake	Wetland with status	Eastern Anatolia	14,682
13	Kızılkuyu	WR	Southeastern Anatolia	14,328
14	Aladağlar	NP	Central Anatolia	13,555
15	Sarıkamış Allahuekber Mountains	NP	Eastern Anatolia	13,071
16	Emresultan	WR	Central Anatolia	11,658
17	Battle of Sakarya	HNP	Central Anatolia	10,840
18	Yüksekova Marshes	Wetland with status	Eastern Anatolia	10,414
19	Sultansazlığı	NP, RAMSAR and Nationally Important Wetland	Central Anatolia	9,769
20	Hürmetçi Marshes	Wetland with status	Central Anatolia	8,646
21	Balıkdamı***	Wetland with status	Central Anatolia	7,533
22	Aras Karasu Floodplain	Wetland with status	Eastern Anatolia	6,662
23	Erçek Lake	Wetland with status	Eastern Anatolia	5,899
24	Çıldır Lake	Wetland with status	Eastern Anatolia	5,734
25	Gölbaşı	SEPA	Central Anatolia	5,395
26	Kop Mountain Defence	HNP	Black Sea	5,044
27	Erzurum Oltu	WR	Eastern Anatolia	4,909
28	Sultansazlığı***	Wetland with status, RAMSAR	Central Anatolia	4,684
29	Bitlis - Adilcevaz Süphandağı	WR	Eastern Anatolia	4,36
30	Gümüşhane Şiran Kuluca	WR	Black Sea	4,182
31	Karkamış Floodplain	Wetland with status	Southeastern Anatolia	4,180
32	Ekşisu Marshes	Wetland with status	Eastern Anatolia	3,990

No	Protected Area Name	Type	Geographical Regions*	Area (ha)**
33	Hakkari Cilo ve Sat Mountains	NP	Eastern Anatolia	3,794
34	Kuyucuk Lake	Wetland with status	Eastern Anatolia	3,171
35	Putka Lake	Wetland with status	Eastern Anatolia	2,921
36	Seyfe Lake	NRA	Central Anatolia	2,863
37	Adana Pozantı Karanfıldağ	WR	Mediterranean	2,813
38	Akgöl (Ereğli Marshes)	NRA	Central Anatolia	2,768
39	Aktaş Lake	Wetland with status	Eastern Anatolia	2,439
40	Ulaş Lake	Wetland with status	Central Anatolia	2,434
41	Turna Lake	Wetland with status	Eastern Anatolia	2,380
42	Tödürge Lake	Wetland with status	Central Anatolia	1,818
43	Ardahan Posof	WR	Eastern Anatolia	1,469
44	Artvin Yusufeli Çoruh Valley	WR	Black Sea	1,445
45	Ihlara	SEPA	Central Anatolia	1,422
46	Botan Valley	NP	Southeastern Anatolia	1,106
47	Dönemeç Delta	Wetland with status	Eastern Anatolia	1,019
48	Arin Lake	Wetland with status	Eastern Anatolia	900
49	Tol Lake	Wetland with status	Central Anatolia	665
50	Boğazköy Alacahöyük	NP	Black Sea	600
51	Sarısu Plain	Wetland with status	Eastern Anatolia	563
	Ankara Beypazarı Kapaklı	WR	Central Anatolia	512
53	Birecik	WR	Southeastern Anatolia	501
54	Çelebibağ Marshes	Wetland with status	Eastern Anatolia	480
55	Meke Maar	Wetland with status	Central Anatolia	444
56	Torum Lake	Wetland with status	Karadeniz Bölgesi	429

No	Protected Area Name	Type	Geographical Regions*	Area (ha)**
57	Bulanık Plain	Wetland with status	Eastern Anatolia	375
58	Çalı Lake	Wetland with status	Eastern Anatolia	330
59	Akgöl	Wetland with status	Eastern Anatolia	314
60	Nenehatun	NP	Eastern Anatolia	305
61	Aygır Lake	Wetland with status	Eastern Anatolia	286
62	Mersin Çamlıyayla Cehennem Stream	WR	Mediterranean	247
63	Malazgirt Battle	HNP	Eastern Anatolia	184
64	Eskişehir Sivrihisar Balıkdamı	WR	Central Anatolia	157
65	Kızören Pothole	Wetland with status	Central Anatolia	110
66	Başkomutan	HNP	Aegean	89
67	Karasu Delta	Wetland with status	Eastern Anatolia	74
68	İstiklal Road	HNP	Central Anatolia	56
69	Kayseri Yahyalı Aladağlar	WR	Central Anatolia	36
70	Ankara Nallıhan Davutoğlan	WR	Central Anatolia	19
71	Yozgat Pinetum	NP	Central Anatolia	12
72	Şanlıurfa Birecik Fırat	WR	Southeastern Anatolia	10

*In case that a protected area intersects with more than one geographic region, the geographic region containing more steppe areas is chosen.

** Protected areas with a steppe area of less than 1 hectare are not given in the table.

*** Some or all of the specified wetlands are protected by other protection statuses. Balıkdamı: Eskişehir Sivrihisar Balıkdamı WR; East Beyazıt Marshes: Ağrı Mountain National Park; Karkamış Floodplain: Şanlıurfa Birecik Fırat WR; Kuyucuk Lake: Kars-Kuyucuk WR; Seyfe Lake: Seyfe Lake NRA; Sultansazlığı: Sultansazlığı NP.

In the light of these data, it is seen that the steppe areas in Turkey are mostly protected by WR and NP statuses. As for NRAs, they have some representations on the edges of wetlands (Table 9). In addition, it is seen that steppe ecosystems are represented in wetlands with status and HNPs. Even if the areas with WR status host steppe ecosystem, the protection status is generally given them due to their fauna elements. For this reason, it is important to assess the steppe species and their habitats as a priority in the planning processes in the protected areas such as Konya Bozdağ WR and Niğde-Çamardı Demirkazık WR, which are

especially important for the steppe areas and include large steppe areas, and to carry out monitoring studies for these species. In National Parks with steppe ecosystem, the inventory, planning and monitoring of steppe habitats and the priority steppe species are important for effective conservation of the steppe areas. However, although they have large steppe areas, representation of the steppes in protected areas with legal status is limited in some provinces. It is important to declare new protected areas for the steppes, especially in Sivas, Van and Kayseri, which have large steppe areas.

3.1.2. Important Biodiversity Areas

Other than the protected areas with legal status, there are also studies of different institutions, which show important areas in terms of biodiversity. One of those is the studies of Systematic Conservation Planning (SCP). These studies have been conducted by the Nature Conservation Centre for the Black Sea Region (Turak et al., 2011), Anatolia Diagonal Region (Ambarlı et al., Unpublished report), and the Lower Caucasus Region (Zeydanlı et al., Unpublished report) and by the Society for the Protection of Nature (SPN) for the Southeastern Anatolia Region (Welch, 2004). In addition, candidate Natura 2000 areas are determined, again with the use of Systematic Conservation Planning (SCP) within the scope of the "Technical Assistance for Strengthening the National Nature Conservation System for the Implementation of Natura 2000 Requirements" carried out by the General Directorate of Nature Conservation and National Parks of the Ministry of Agriculture and Forestry in the Central Anatolian Region (Tarım ve Orman Bakanlığı, 2018c).

According to the studies that use the Systematic Conservation Planning approach, in which the biodiversity elements and the threats in the region are assessed together, there are 62 "Conservation Priority Areas", all or part (as a threshold, at least 10% of its surface area has been used) of which are located in the potential steppe zone, and the steppe ecosystems are represented in almost all of these areas. The Conservation Priority Areas in the potential steppe zone cover an area of 1,990,326 ha. In addition, 29 candidate Natura 2000 sites have been identified within the boundaries of the potential steppe zone. These areas cover an area of 1,526,839 ha. In Figure 17, conservation priority areas and candidate Natura 2000 areas defined as a result of these studies are given. Table 10 also presents the sizes of the steppe areas in these sites. The areas that stand out in terms of steppes are Mardin Mountains, Karapınar - Ereğli Plains, West Karacadağ and West Ceylanpınar Conservation Priority Areas.

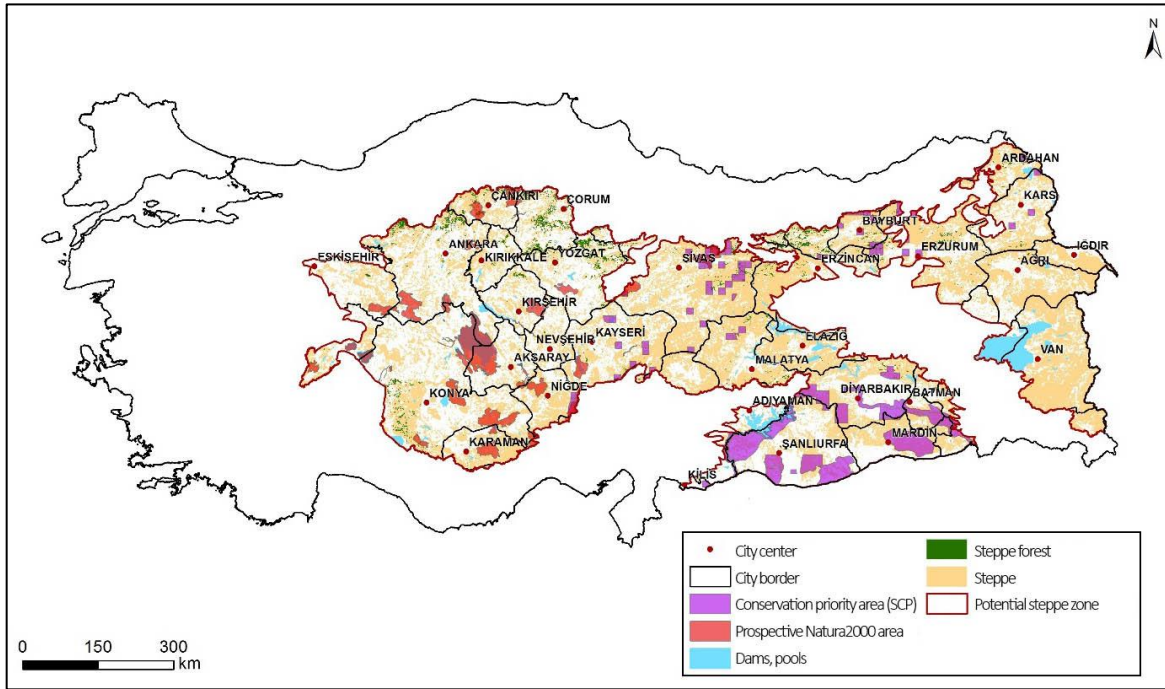


Figure 17. Priority Conservation Areas (1,990,326 ha) and candidate Natura 2000 areas (1,526,839 ha) determined as a result of Systematic Conservation Planning studies in the potential steppe zone in Turkey ©DKM

Table 10. The size of the steppe areas in the Priority Conservation Areas

no	Name*	Province	Steppe area (ha)
1	Mardin Mountains - Biosphere Reserve	Mardin	167,984
2	Karapınar-Ereğli Plains	Konya, Ereğli	97,914
3	West Karacadağ	Diyarbakır - Şanlıurfa	80,814
4	West Ceylanpınar	Şanlıurfa	72,467
5	Hasankeyf	Batman – Mardin - Siirt	68,974
6	East Karacadağ	Diyarbakır - Şanlıurfa	58,042
7	Bozdağlar	Konya	56,618
8	Hasan Dağı - Melendiz Mountains	Niğde, Aksaray	53,082
9	Ayrancı Steppes	Karaman	50,908
10	Urfa Steppe	Şanlıurfa	41,711
11	Hafik-Zara Gypsum Hills	Sivas	35,851
12	Aladağlar	Niğde - Adana	34,187

no	Name*	Province	Steppe area (ha)
13	Güçlükonak / Taşkonak	Şırnak – Mardin - Siirt	33,203
14	Sivas Gypsum Karsts	Sivas	32,012
15	Upper Sakarya River	Eskişehir, Ankara, Konya	29,049
16	Ilgaz Mountain	Çankırı, Çorum, Kastamonu	27,387
17	Kop Mountain	Erzurum - Bayburt	26,689
18	Hazro	Diyarbakır	25,739
19	Divriği-İmranlı Forests	Sivas	25,015
20	Sultansazlığı	Kayseri	23,991
21	Eldivan Hills	Çankırı	23,534
22	Hekimhan	Malatya	23,157
23	Aladağlar	Niğde, Adana, Kayseri	22,025
24	Dedekaya Hills	Ankara	20,886
25	Kösedağ	Sivas	19,365
26	Tatlısu Basın	Sivas	18,464
27	Kumalar Mountain	Afyonkarahisar	16,814
28	Çöl Lake	Ankara, Konya	15,853
29	South of Gürlevik Mountain	Sivas	15,726
30	South of İmranlı	Sivas	15,705
31	Akören-Çumra Steppes	Konya	15,417
32	Pınarbaşı	Kayseri	14,713
33	North İspir	Erzurum	11,164
34	Palas Lake	Kayseri	9,983
35	Aslantaş	Kayseri - Adana	9,326
36	Hezanlı Mountain	Sivas - Kahramanmaraş	8,870
37	Sakar Mountain Oak Forests	Sivas	8,052
38	Bayburt	Bayburt	7,848
39	Karaseki Plain	Sivas	7,750
40	Tohma Watercourse Valley	Sivas	7,322
41	Digor	Kars	6,400
42	İspir Devedağı	Erzurum	6,341
43	Karababa Mountain	Sivas	6,041
44	Elbaşı	Kayseri	5,112
45	Vavuk Mountain Pass	Bayburt - Gümüşhane	4,937

no	Name*	Province	Steppe area (ha)
46	Kolçekmez Mountain	Gümüşhane	3,802
47	East of Sakaltutan Pass	Gümüşhane - Erzincan	1,394

* Conservation Priority Areas and candidate Natura 2000 areas, which have steppes in more than 50% of its surface area, are shown in the table. Candidate Natura 2000 fields are shown in gray.

An important study on the steppe ecosystem and steppe species is the Important Plant Areas (IPA) study conducted by the Society of the Protection of Nature (Özhatay et al., 2003, Özhatay, N. 2006). All or part (at least 10% of its surface area) of the 53 IPAs determined by considering the distribution of rare and endangered plant species are within the boundaries of the potential steppe zone (

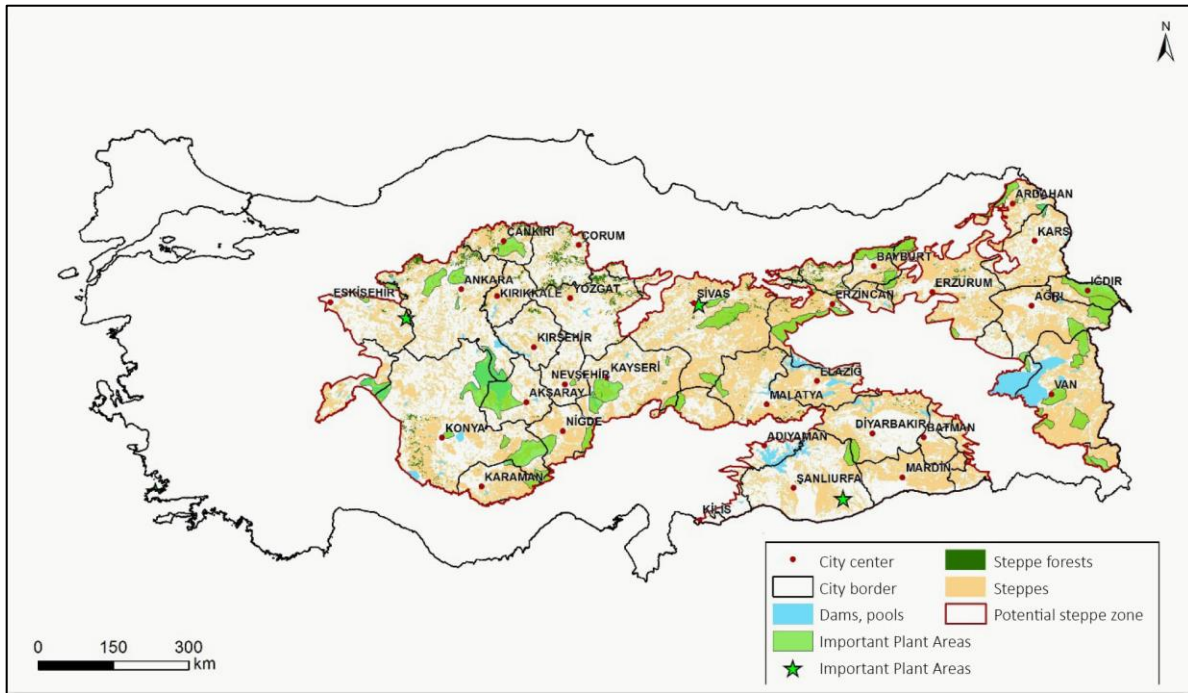


Figure 18). In Table 11, sizes of the steppe areas in these areas are given. Iğdır Plain, Tendürek Mountain and Karacadağ stand out in terms of steppe areas.

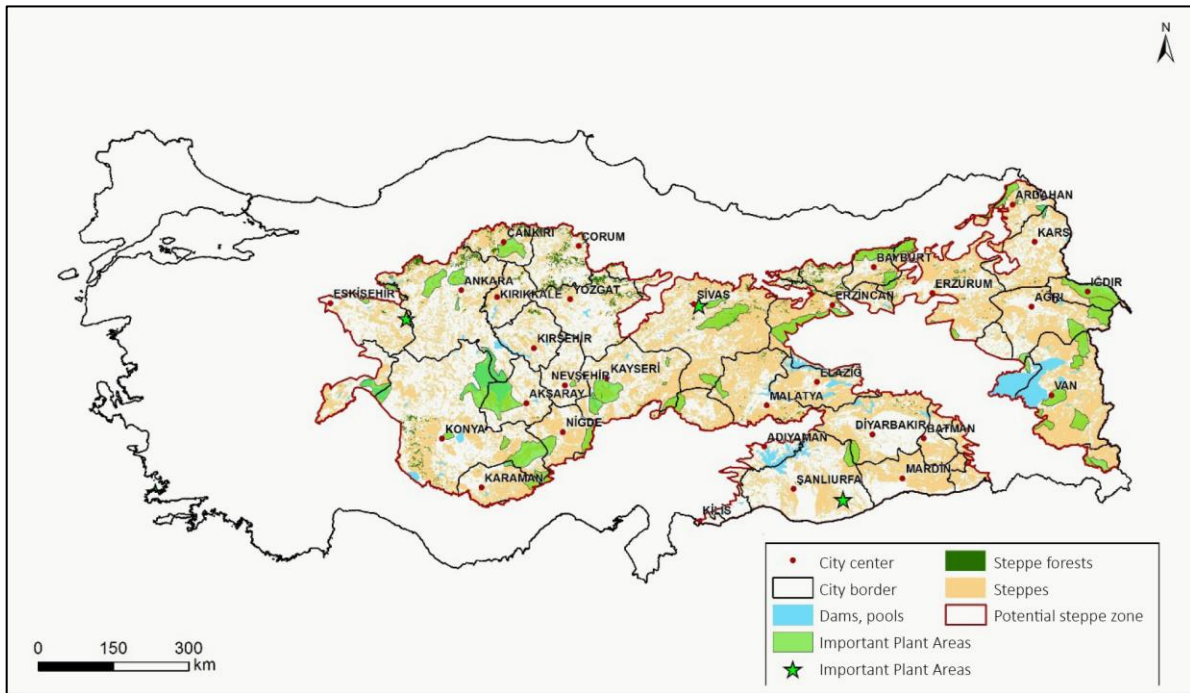


Figure 18. The Important Plant Areas (>2,800,000 ha) within the potential steppe zone in Turkey. The certain IPAs (indicated by * on the map) could not be shown on the map since their boundaries were not set ©DKM

Table 11. The size of steppe areas in the Important Plant Areas

No	Name*	Province	Steppe area (ha)
1	Iğdır Plain	Iğdır	85,466
2	Tendürek Mountain	Ağrı, Van	81,132
3	Karacadağ	Diyarbakır, Şanlıurfa	68,921
4	Erciyes Mountain	Kayseri	67,210
5	Binboğa Mountains	Kahramanmaraş, Kayseri	57,207
6	Erek Mountain	Van	48,385
7	Tohma Valley (Gürün-Darende)	Malatya, Sivas	46,687
8	Kop Mountain	Bayburt, Erzurum	31,255
9	Pirreşit Mountain	Van	27,832
10	Karapınar Plain	Konya	14,298
11	Akyay Lake	Konya	10,237
12	Poske	Erzincan, Gümüşhane	1,912
13	Nallıhan Bird Paradise	Ankara	895
14	Topçuyeniköy	Sivas	425

*The IPAs that more than 50% of whose area is steppe area are shown.

Another study on the important biodiversity areas is the Key Biodiversity Areas defined by Doğa Derneği (BirdLife in Turkey) (KBA; Eken et al., 2006). All or part (at least 10% of its surface area) of 122 of which rare and endangered species belonging to many different living groups are assessed and identified, intersect with the potential steppe zone (

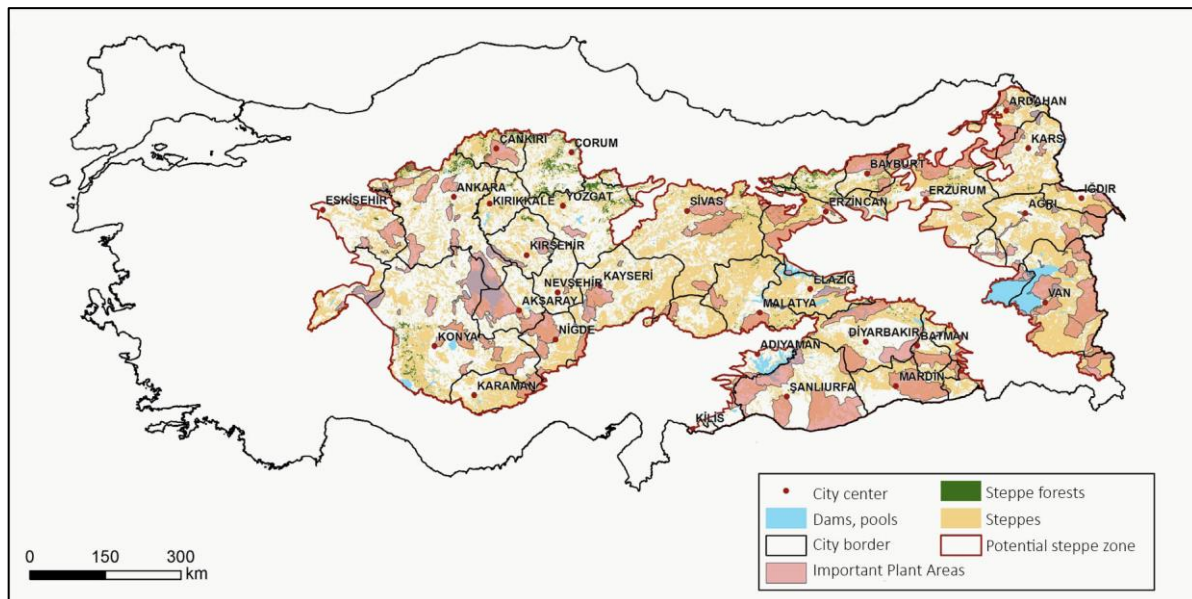


Figure 19). 81 of these areas are also Important Bird Areas (IBA). KBAs within the potential

steppe zone cover 7,001,922 ha. Of these areas, the areas that stand out with their special steppe ecosystems are Şanlıurfa Akçakale Steppes KBA, Bozova KBA, South Euphrates Valley and Birecik Steppes KBA covering the Şanlıurfa-Adıyaman-Gaziantep region, and Olur-Oltu Steppes KBA in Erzurum and Acıkır Steppes KBA. In addition, the Mardin Mountains KBA, Ceylanpınar KBA, and Van Eastern Mountains KBA that more than 50% of whose area is steppe area stand out in terms of the steppe ecosystems (Table 12).

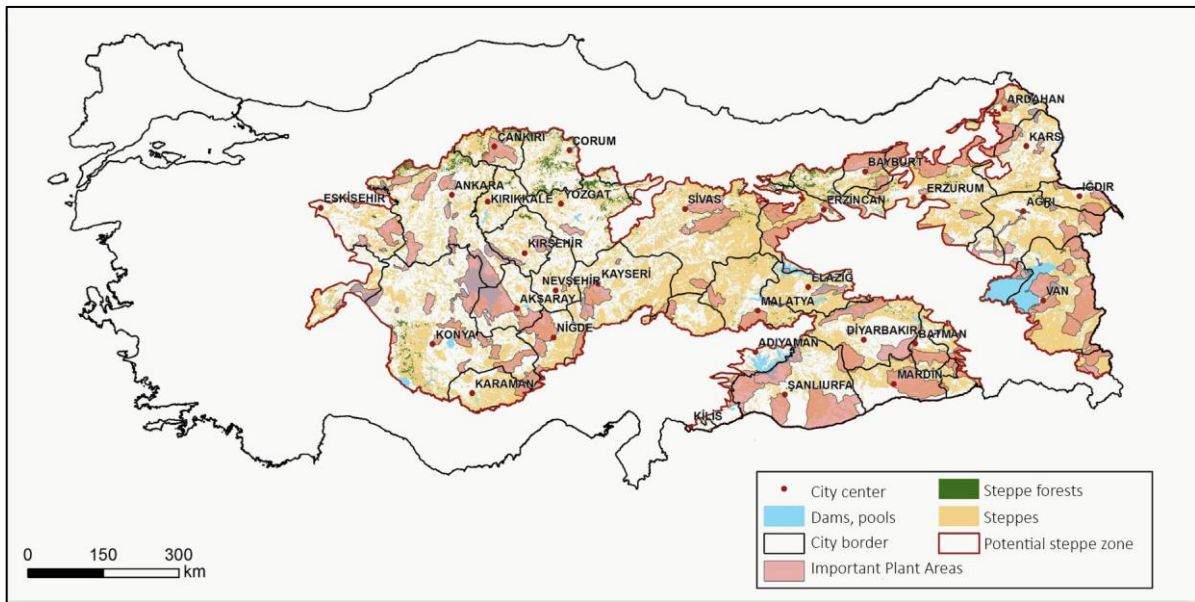


Figure 19. The Key Biodiversity Areas (7,001,922 ha) within the potential steppe in Turkey ©DKM

Table 12. The sizes of the steppe areas in the Key Biodiversity Areas

No	Name*	Province	Steppe area (ha)
1	Mardin Mountains	Mardin - Şırnak	239,287
2	Ceylanpınar	Şanlıurfa	201,284
3	Van Eastern Mountains	Van	163,332
4	Hasan Mountain	Aksaray - Niğde	141,610
5	Karacadağ	Diyarbakır - Şanlıurfa - Mardin	125,107
6	Tecer Mountains	Sivas	123,071
7	Dicle Valley	Batman - Mardin - Siirt - Şırnak - Diyarbakır	117,865

No	Name*	Province	Steppe area (ha)
8	Southeast Taurus Threshold	Diyarbakır - Elazığ - Bingöl	115,428
9	Ağrı Mountain	Ağrı - Iğdır	106,748
10	Tortum Basin	Erzurum - Artvin	102,486
11	Ereğli Plain	Konya - Niğde - Karaman	98,347
12	Mordağlar	Hakkari - Van	94,187
13	Tendürek Mountain	Van - Ağrı	77,272
14	Kubbe Mountain	Malatya - Adıyaman	71,169
15	Hodulbaba Mountain	Konya	70,422
16	Akçakale Steppes	Şanlıurfa	70,061
17	Çankırı Gypsum Hills	Çankırı - Ankara	66,270
18	Erciyes Mountain	Kayseri	64,346
19	Tohma Valley	Malatya - Sivas	61,963
20	Acıkır Steppes	Eskişehir	60,091
21	İspiriz Mountain	Van	58,897
22	Van Plain	Van	57,104
23	Binboğa Mountains	Kahramanmaraş - Kayseri	47,332
24	Erek Mountain and Turna Lake	Van	44,551
25	Kop Mountain	Bayburt - Erzurum	30,525
26	Pirreşit Mountain	Van	30,264
27	Çaldıran Plain	Van	25,963
28	Karapınar Plain	Konya	24,359
29	Sultansazlığı	Kayseri	23,193
30	Karasu Plain	Erzurum	19,792
31	Sarıyar Dam	Eskişehir - Ankara	19,447
32	Kirmir Valley	Ankara	19,168
33	Obruk Plateau	Konya	18,130
34	Ardahan Forest	Ardahan	17,698
35	Kars Plain	Kars	15,076
36	Akyay Plain	Konya	9,278
37	Hotamış Reeds	Konya - Karaman	9,189
38	Hürmetçi Reeds	Kayseri	4,811
39	Göreme Hills	Nevşehir	3,557
40	Beynam Forests	Ankara	2,938

No	Name*	Province	Steppe area (ha)
41	Çiçekli Lakes	Van	1,771
42	Ekşisu Reeds	Erzincan	1,613
43	Akkaya Pond	Niğde	406

*The IPAs that more than 50% of whose area is steppe area are shown.

In this context, another one of the studies carried out on a national scale is the Prime Butterfly Areas (PBAs) defined by the Nature Conservation Centre. PBAs are the areas determined by taking into consideration the areas which are rich in butterfly diversity, especially the rare, endemic and endangered species (Karaçetin et al., 2011). All or part (at least 10% of its surface area) of 37 of 65 PBAs defined on national scale are located within the potential steppe zone and coincides with the steppe areas (

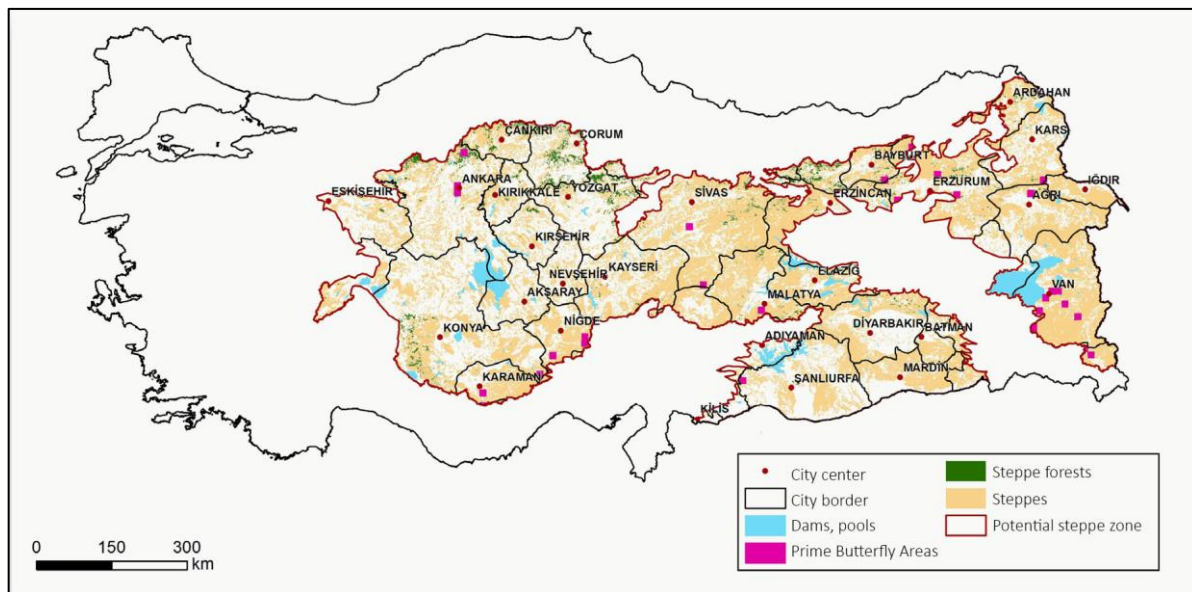


Figure 20). The sizes of the steppe areas in the PBAs are given in Table 13.

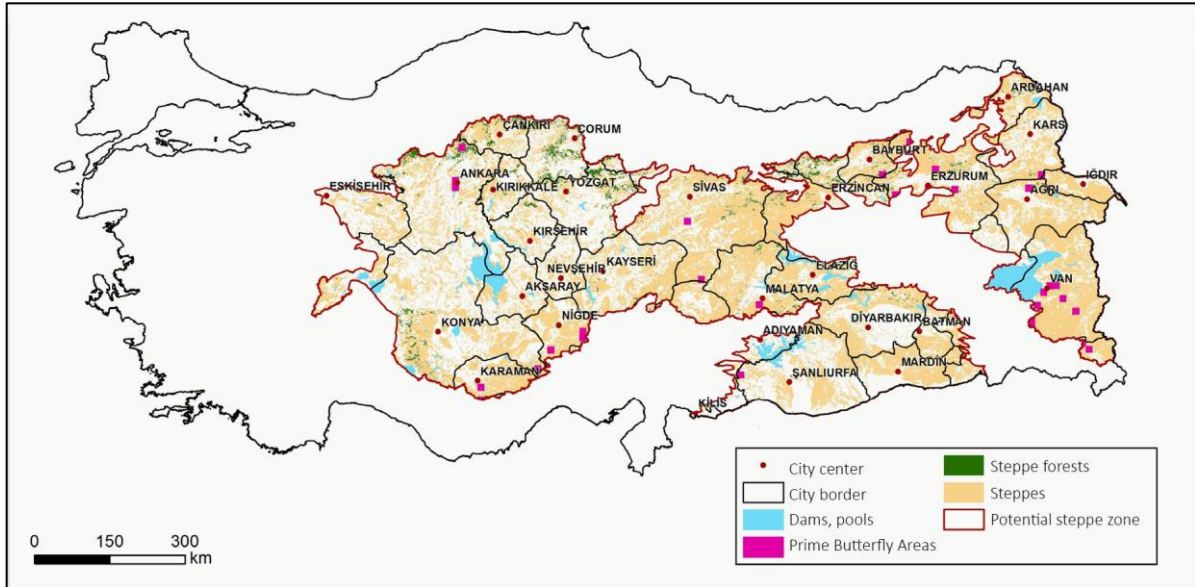


Figure 20. The Prime Butterfly Areas in the potential steppe zone in Turkey ©DKM

Table 13. The sizes of the steppe areas in the Prime Butterfly Areas

No	PBA Name*	Province	Steppe area (ha)
1	Erek Mountain	Van	17,833
2	Aladağlar	Niğde	16,770
3	Çatak Valley	Van	11,964
4	Güzeldere Pass	Van	9,864
5	Bolkar Mountains	Konya - Mersin	9,472
6	Duranlar	Kars - Iğdır	9,139
7	Gökpınar	Sivas - Kahramanmaraş	8,870
8	Taşlıyurt	Erzurum	8,513
9	Yüksekova	Hakkari	8,473
10	Güzelsu	Van	8,178
11	Yeşilyurt	Malatya	8,061
12	Artos Mountain	Van	7,771
13	Çaykavak Pass	Niğde	6,971
14	Dumlu	Erzurum	6,899
15	South of Karaman	Karaman	6,899
16	Kop Mountain	Bayburt - Erzurum	6,296
17	İspir	Erzurum	5,737

No	PBA Name*	Province	Steppe area (ha)
18	North of Ağrı	Ağrı	5,548
19	South of Aşkale	Erzurum	5,140
20	Sertavul Pass	Karaman - Mersin	4,980

*The PBAs that more than 50% of whose area is steppe area are shown.

3.1.3. Large Plains

Even though it is different from the above protection statuses, another status in terms of their use within the borders of Turkey is Agricultural SITE (Large Plains) status. More than 252 of Large Plains have been declared with the decision of the Council of Ministers in accordance with the Soil Preservation and Land Use Law No.5403 in Turkey, in order to prevent the degradation of areas with high agricultural potential against erosion, desertification, pollution and misuse. These plains cover approximately 7,299,162 ha area and it corresponds to 22% of the potential steppe zone. 11% (801,085 ha) of the total area of the large plains in this region corresponds to steppe areas. In particular, Konya and Şanlıurfa are the provinces where the Large Plain Protection Areas cover large areas (

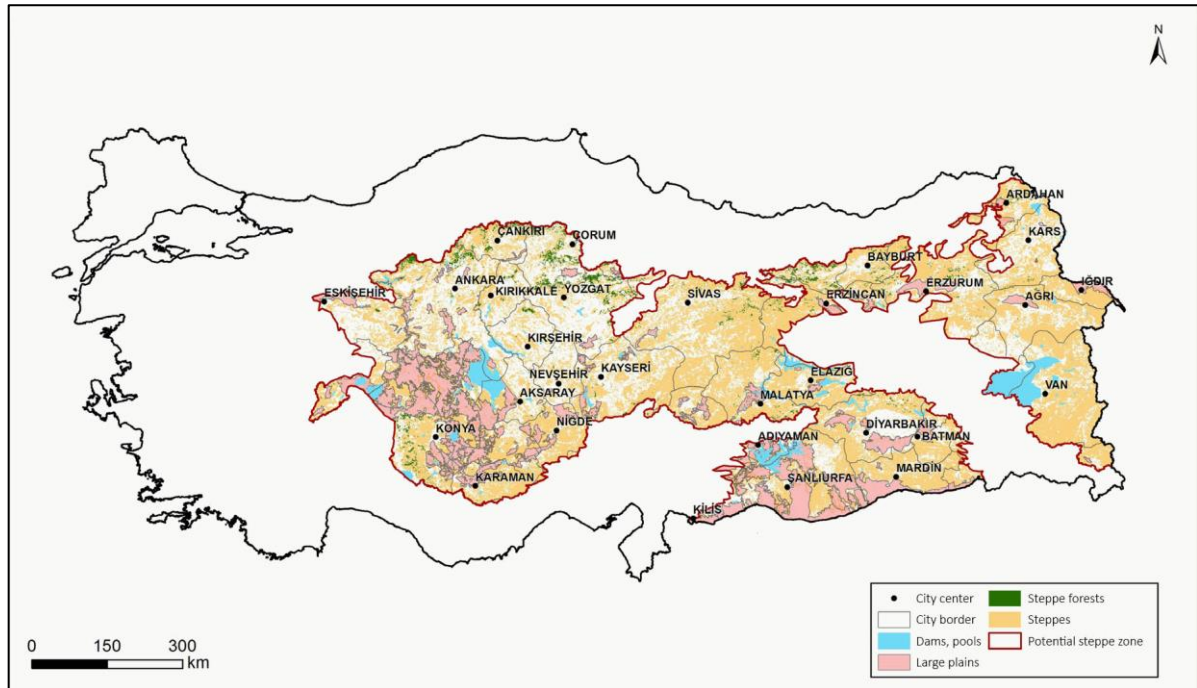


Figure 21).

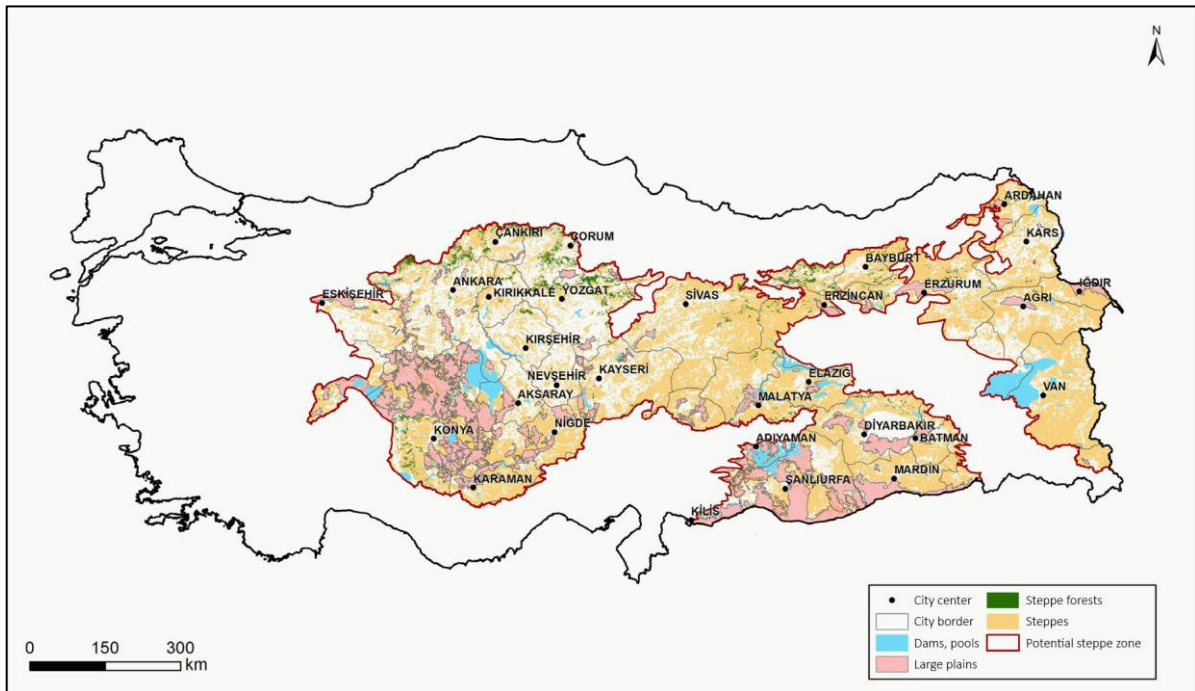


Figure 21. The Large Plains within the potential steppe zone in Turkey (7,299,162 ha) ©DKM

There are overlaps between the areas declared as the Large Plain and the protected areas with legal status (Figure 22). Sultansazlığı NP and Konya Bozdağ WR are between the Large Plains. There are also overlaps between the Kızılkuyu WR area boundaries and the areas declared as the Large Plain. In addition, the Kızören Pothole and the Kuyucuk Lake Wetlands with Status and the areas declared as Large Plain overlap to a high extent. Karkamış Floodplain, South Keman, Tol Lake, Akşehir-Eber Lakes and Ekşisu Marshes Wetlands also have parts that overlap with the areas declared as the Large Plain. The steppe areas may be threatened by the need for new structuring in the stages of processing, storage and marketing of increasing plant production due to the onset of irrigation in these plains. In addition, the natural habitats and other elements of biodiversity are expected to decrease as the intensive agricultural production activities increase in these areas. Therefore, it is important to take precautions regarding the steppe areas in and near the Large Plains.

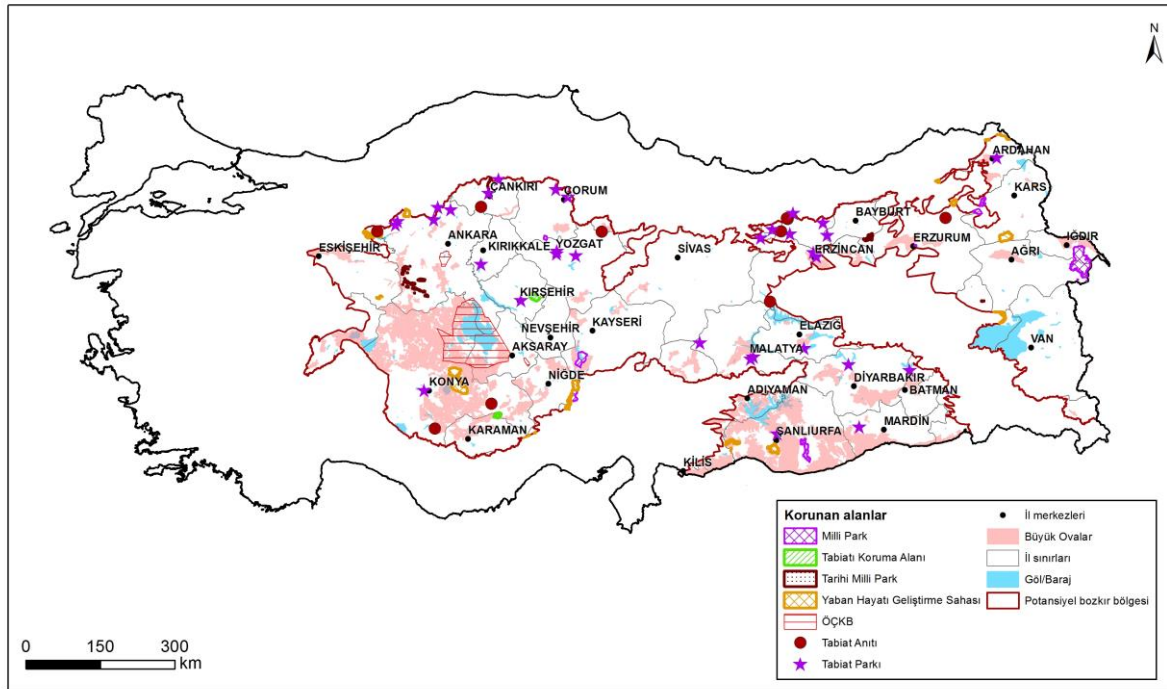


Figure 22. The Large Plains and potential protected areas within the potential steppes in Turkey ©DKM

3.1.4. General Directorate of Agricultural Enterprises (GDAE) Lands

Even though it is not a protection area with legal status, the General Directorate of Agricultural Enterprises (GDAE) Lands in Turkey have been the areas that provide a level of protection to the steppe areas and the species that they host, within the scope of their operation methods and practices. Within the potential steppe zone in Turkey, there are 16 GDAE lands that can function in this way (Table 14,

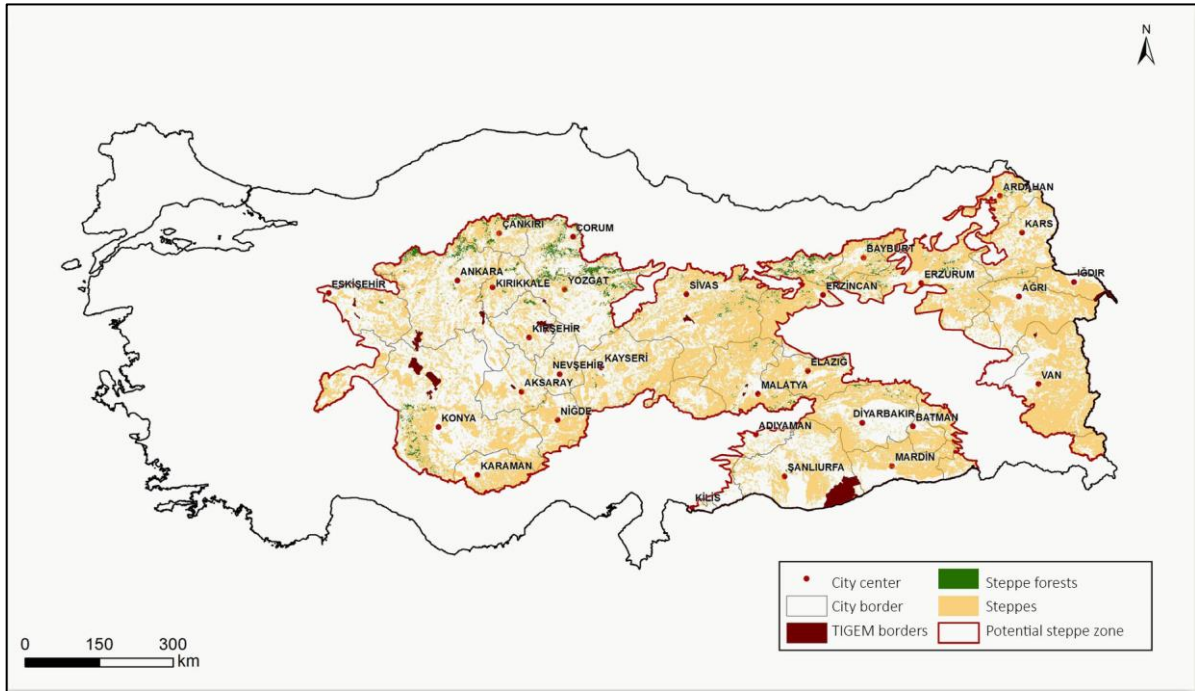


Figure 23). These areas are densely settled especially in the Central Anatolia Region. In these areas, maintaining dry farming practices and not using agricultural chemicals are important for the survival of the steppe creatures.

Table 14. The management types and sizes of GDAE lands within the potential steppe zone and the provinces in which they are located.

GDAE name	Administration	Total Land (ha)	Province
Altındere Agricultural Enterprise	Private-Leaseholder	1,987	Van
Altınova Agricultural Enterprise	GDAE	31,137	Konya
Anadolu Agricultural Enterprise	GDAE	4,482	Eskişehir
Bala Agricultural Enterprise	Private-Leaseholder	8,384	Ankara
Ceylanpınar Agricultural Enterprise	GDAE	163,386	Şanlıurfa
Çiçekdağı Agricultural Enterprise	Private-Leaseholder	1,638	Kırşehir
Göle Agricultural Enterprise	Private-Leaseholder	1,437	Ardahan
Gözlü Agricultural Enterprise	GDAE	28,830	Konya

GDAE name	Administration	Total Land (ha)	Province
Hafik Agricultural Enterprise	Private-Leaseholder	252	Sivas
Kazımkarabekir Agricultural Enterprise	GDAE	18,787	Iğdır
Koçaş Agricultural Enterprise	GDAE	2,549	Aksaray
Konuklar Agricultural Enterprise	GDAE	4,457	Konya
Malya Agricultural Enterprise	GDAE	20,919	Kırşehir
Polatlı Agricultural Enterprise	GDAE	21,587	Ankara
Sultansuyu Agricultural Enterprise	GDAE	2,663	Malatya
Ulaş Agricultural Enterprise	GDAE	7,146	Sivas

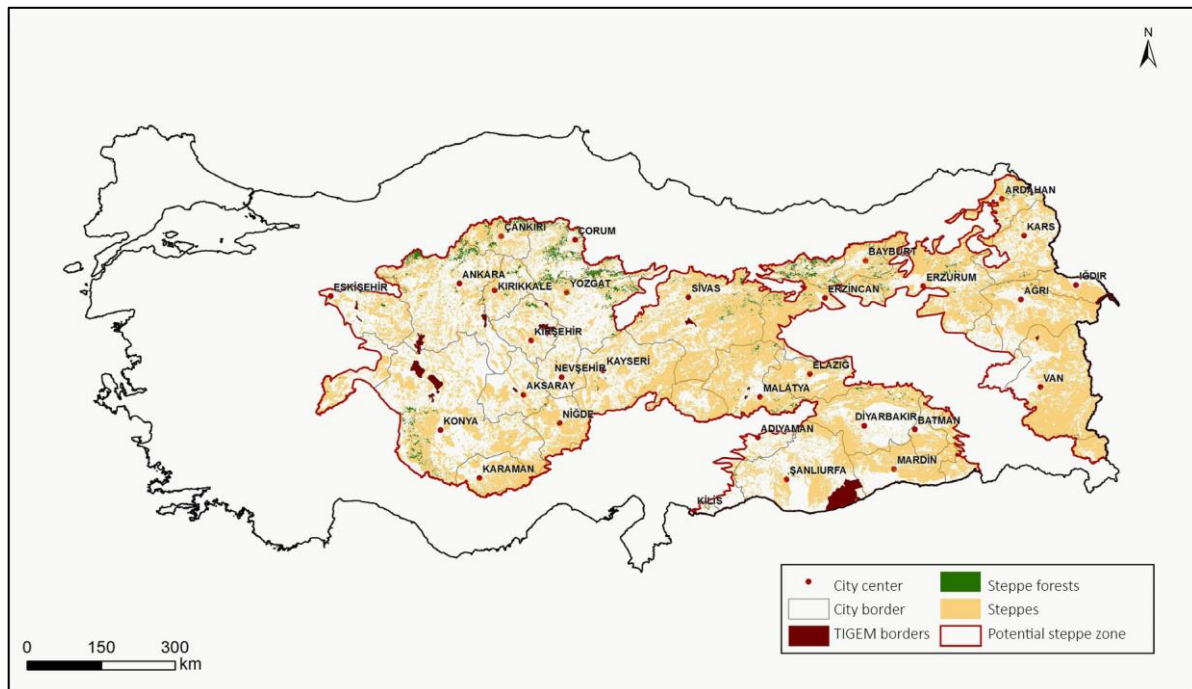


Figure 23. The GDAE lands within the potential steppe zone in Turkey (319,641 ha) ©DKM

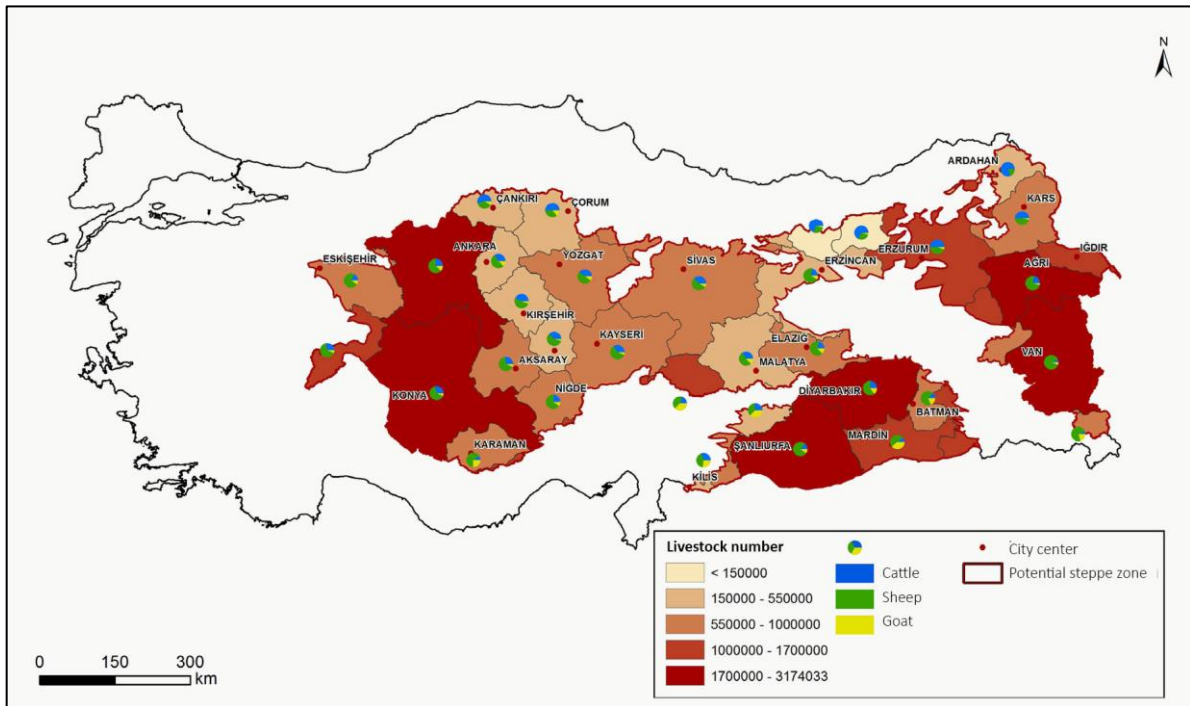
3.2. Threats to the Steppes

The steppes, which are the natural vegetation of the steppe ecosystems in Turkey and vital in terms of biodiversity, are under threat by various factors. Transformation of the steppes into agricultural fields with the increase of mechanization in agricultural activities, intensive agriculture and animal husbandry activities (overgrazing) and drought as a result of climate change are the main threats to the steppes. Increasing settlement pressure, irrigation projects, energy investments, mining activities also cause irreversible loss of steppe areas.

Illegal hunting and species trafficking, excessive plant collection and intensive agricultural activities in the region also threaten the steppe ecosystems and species that they host. Today, the steppes continue their existence in stony or rocky areas as islets that contain remains of natural vegetation among agricultural fields and grazing areas. The lack of awareness about the importance of steppe species in Turkey, and the conservation efforts for these species being limited to the protected areas are the other factors that negatively affect the biodiversity of steppes. At the same time, these ecosystems, which are already under threat, are considered to become more sensitive in the future, with the risk of drought and erosion predicted to increase due to climate change.

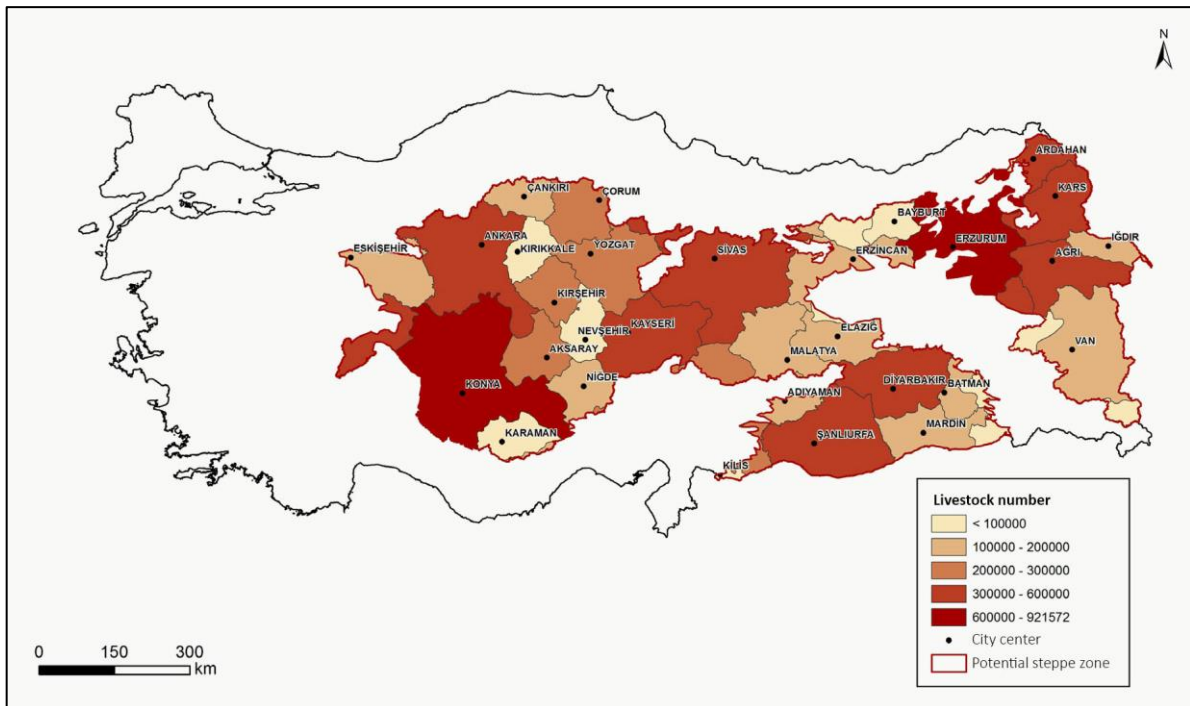
3.2.1. Grazing Pressure

Animal husbandry stands out as one of the main sources of income in the regions where steppe vegetation is dominant, especially in the Eastern Anatolia Region. It is very important that this activity which is economically important is sustainable in the long term, grazing is done in a planned manner in order not to damage the natural vegetation of the area, and that some traditional practices are continued. In order to assess the pressure from the current grazing activities on the steppes, numbers of ovine and bovine animals have been taken from TURKSTAT on district basis and converted into spatial data and their relationship with the steppes has been assessed spatially. Dominant species used in the animal husbandry vary spatially. Within the potential steppe zone in Turkey, bovine breeding is common in Northeast Anatolia (cattle), whereas mostly ovine breeding (mostly sheep) is common in other regions. As for Kahramanmaraş, Mardin and Adıyaman, the goat breeding is common (



Figure

24,



Figure

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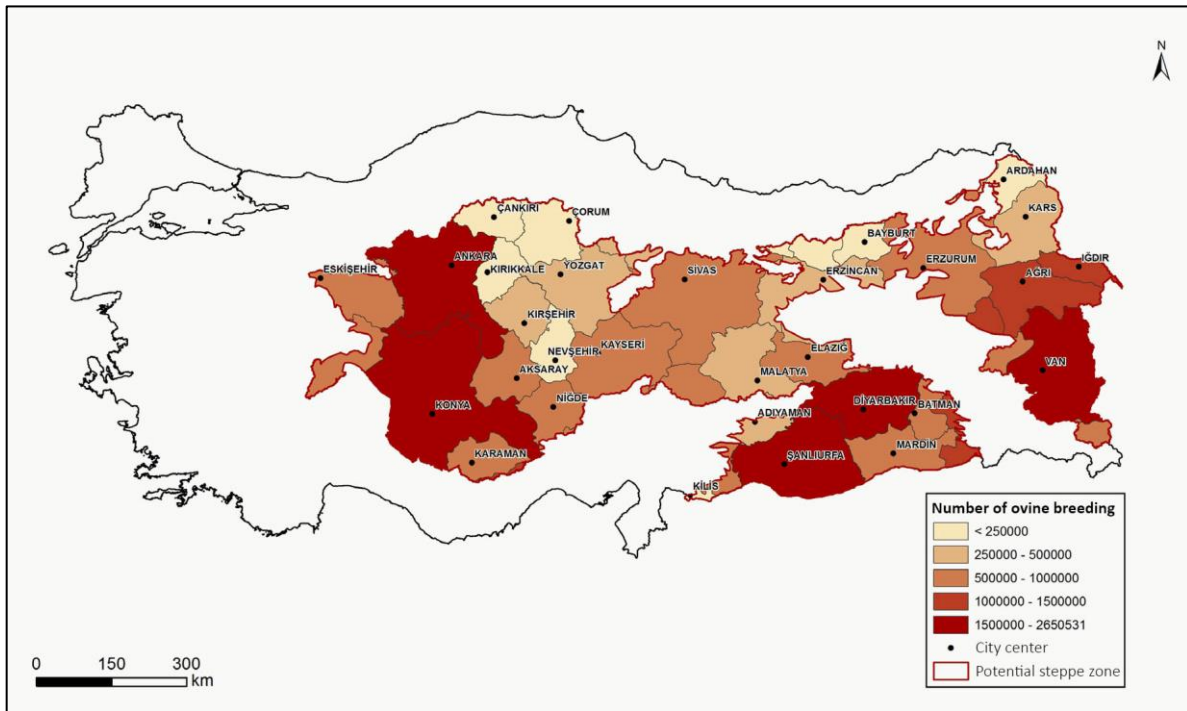


Figure 26, Table 7). The spatial distribution of district-based numbers of livestock animals are given in

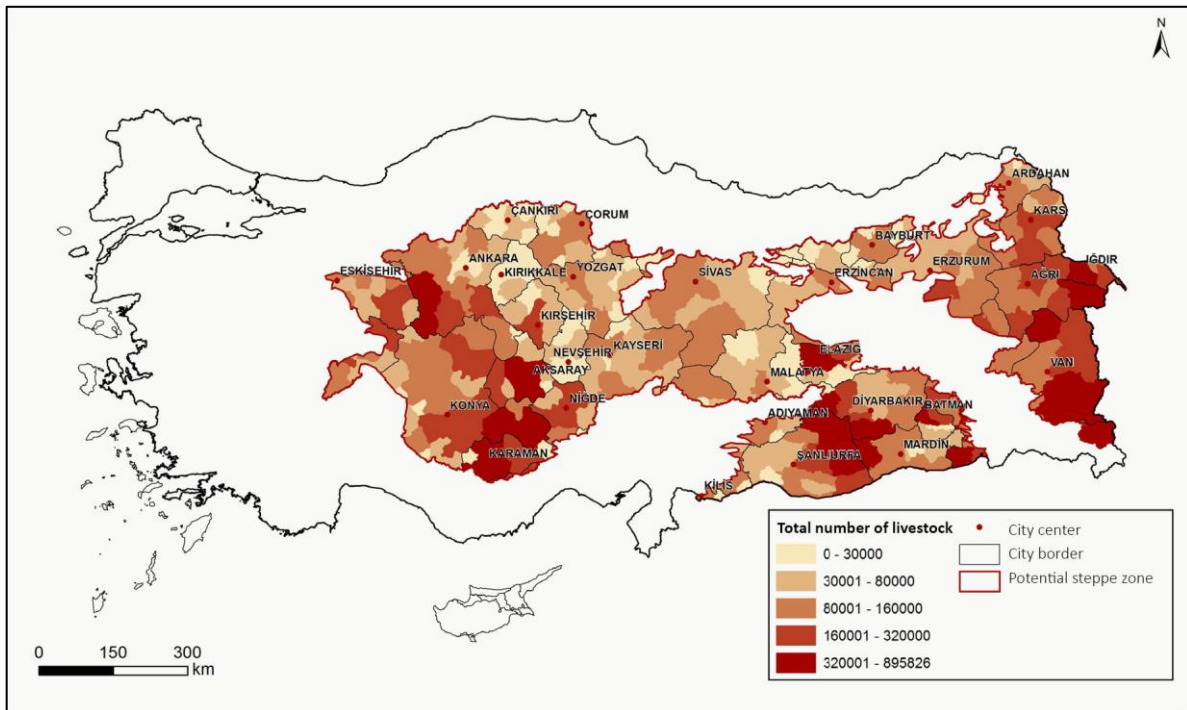
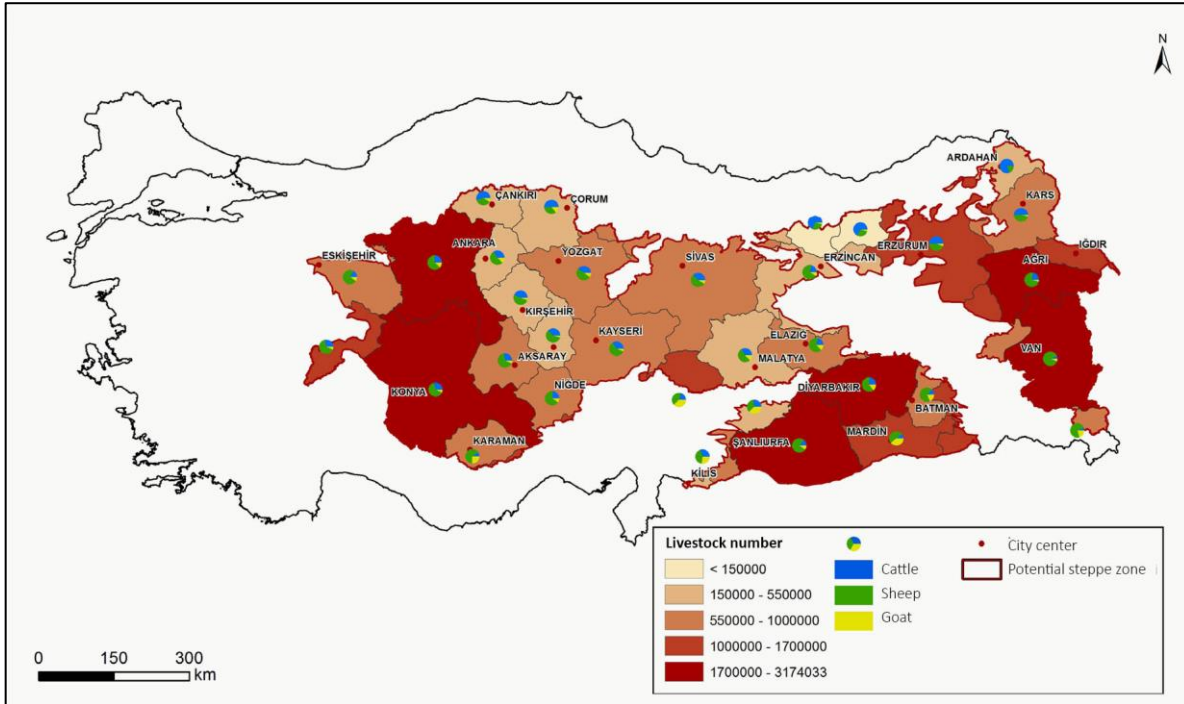


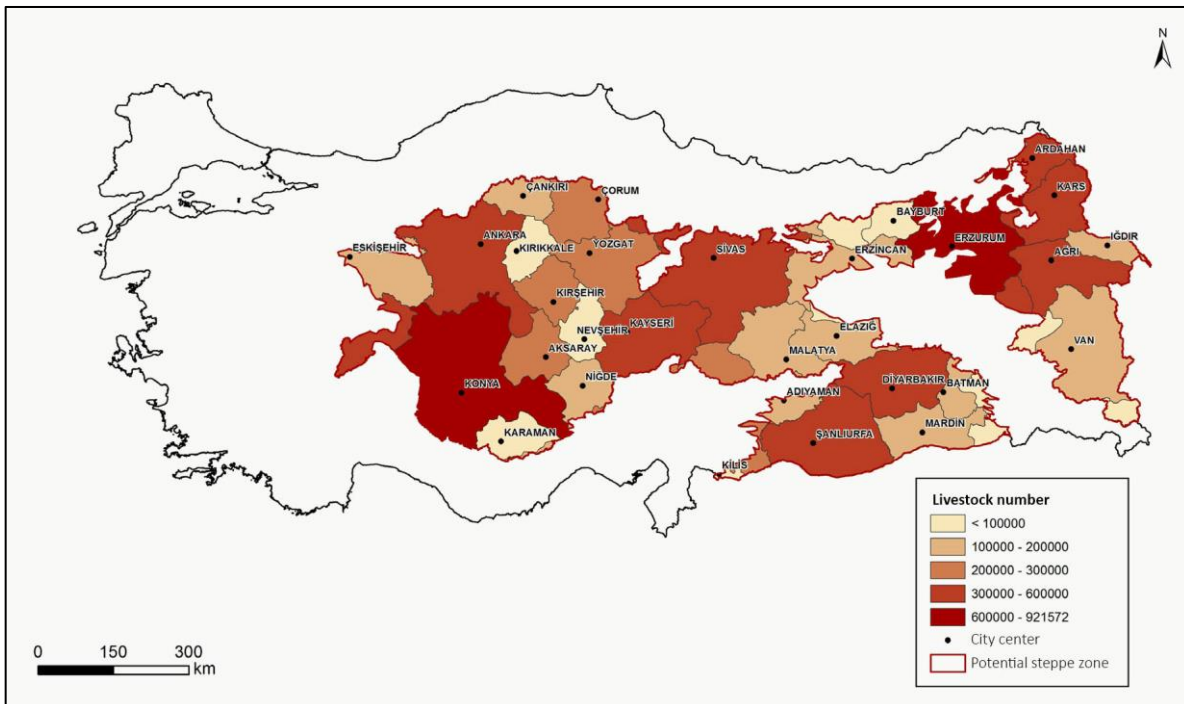
Figure 27 and its table is in Annex 3.

According to the assessment made by using the data of TURKSTAT, among the provinces hosting some steppe areas, provinces with the highest number of livestock are Konya, Ankara, Van, Ağrı, Şanlıurfa and Diyarbakır (



Figure

24,



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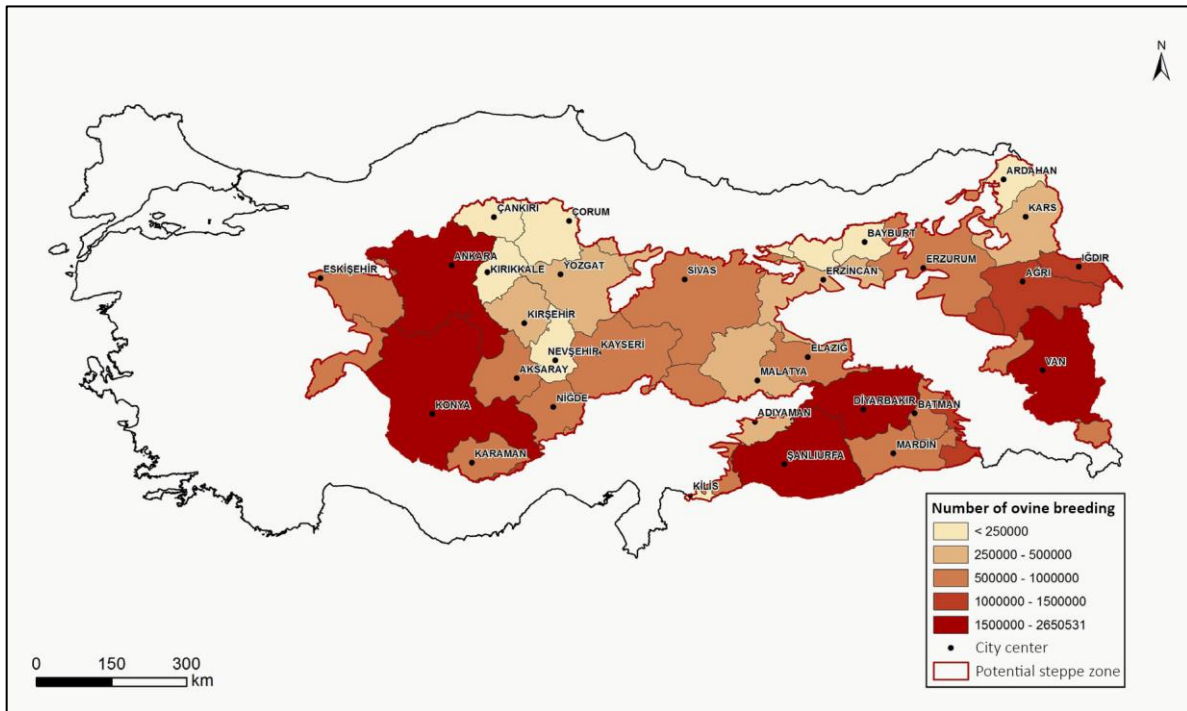


Figure 26, Table 7). Making and supporting exemplary practices for holistic grazing management to perform sustainable and regenerative rangeland management in these areas where there is intensive animal husbandry, are very important for the conservation of steppes.

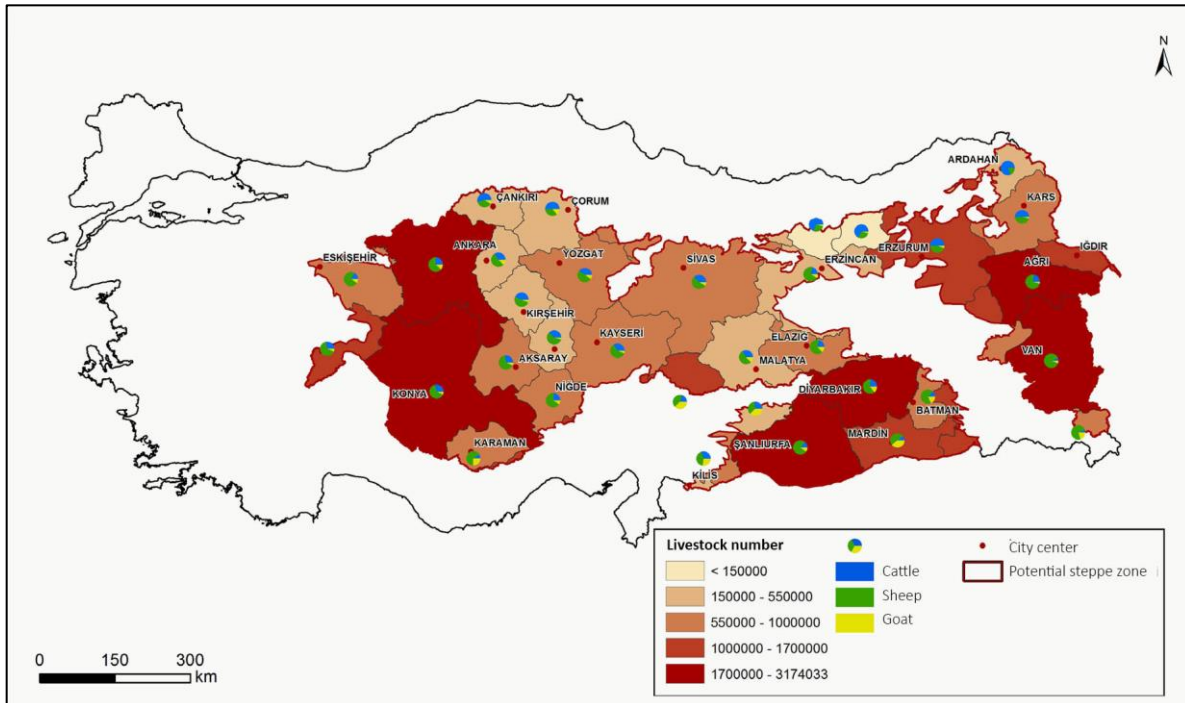


Figure 24. The number of livestock by provinces and distribution by species within the potential steppe zone in Turkey ©DKM

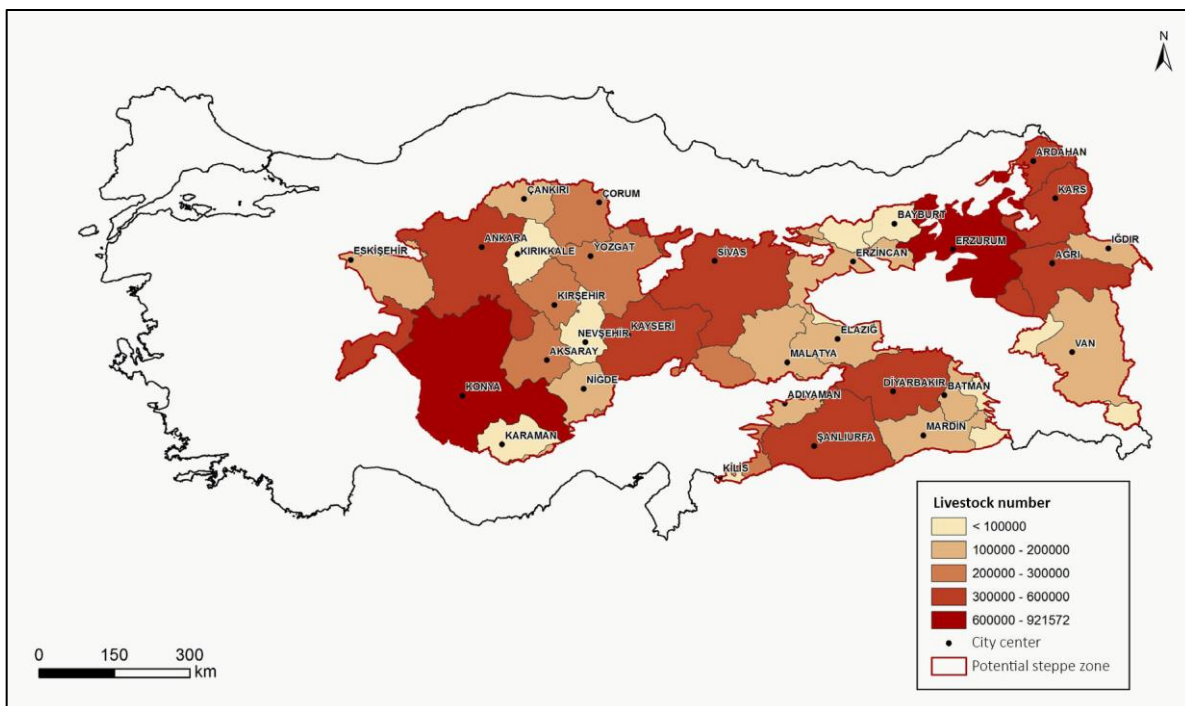


Figure 25. The number of bovine animals by provinces within the potential steppe zone in Turkey ©DKM

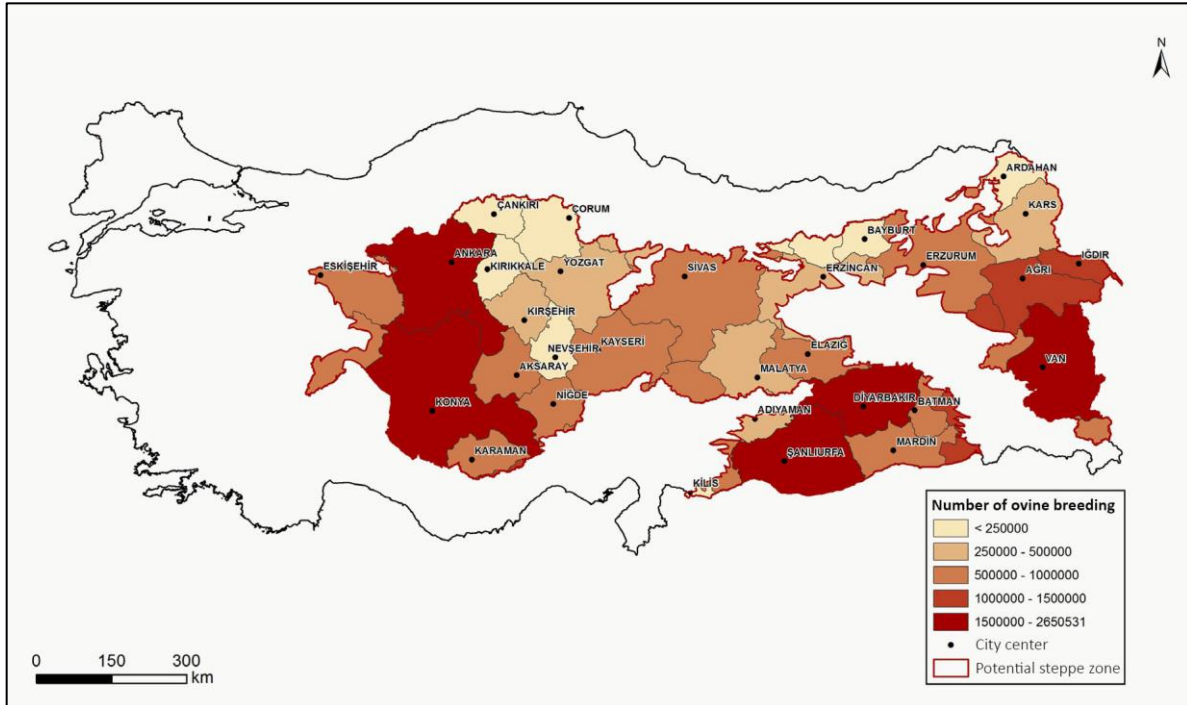


Figure 26. The number of ovine animals by provinces within the potential steppe zone in Turkey ©DKM

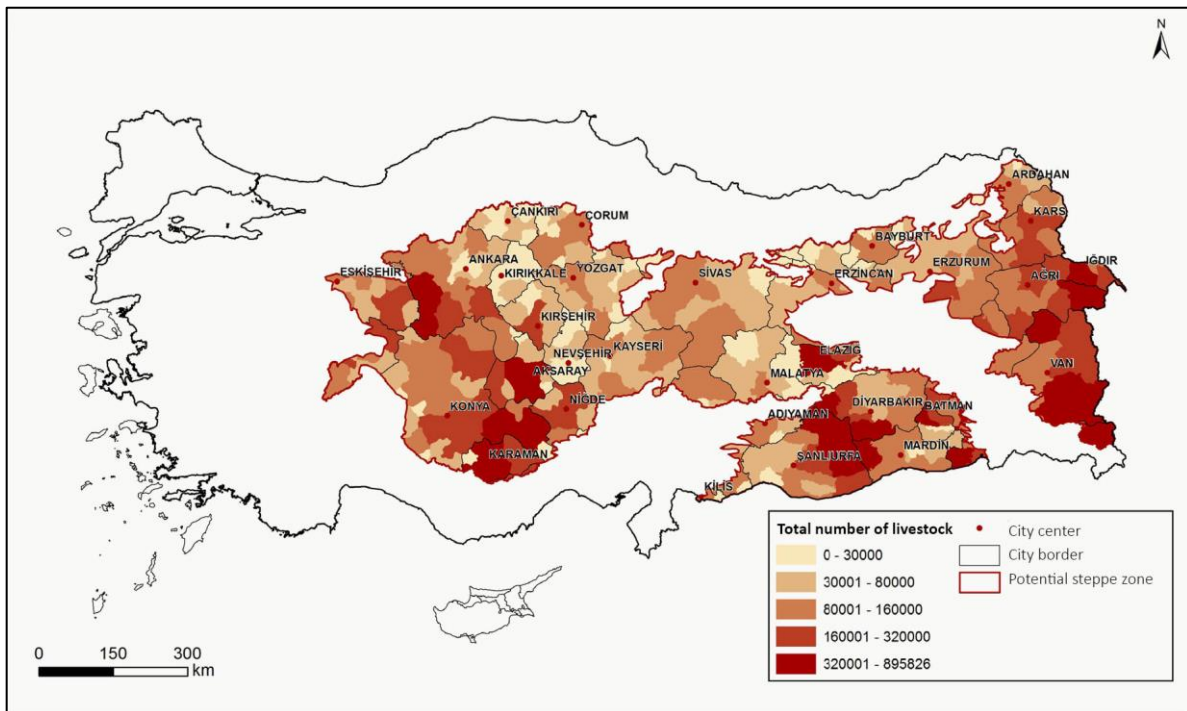


Figure 27. The number of livestock by districts within the potential steppe zone in Turkey ©DKM

Another assessment regarding the grazing pressure has been made on the size of the rangelands and numbers of livestock in the provinces within the potential steppe zone (Table 7). Since the grazing pressure of each animal species/age group on the rangeland will be different, the animal units given in the Official Gazette Pasture Regulation numbered 23419, Section 2, Article 6 were used⁵. For TURKSTAT 2019 animal data, each animal group has been multiplied by the corresponding animal unit equivalents given in Table 15, and all animal species are included in the calculations as bovine units. Afterward, grazing pressure across the province was evaluated by calculating the unit of rangeland area (ha) per animal number for each province (Figure 28). In this evaluation, since there is no data on how much of the bovine and ovine graze on rangelands and how many of them are in closed systems and in the corrals, it is assumed that all animals in the province use the rangelands.

Table 15. The numbers of the animal species mentioned in the Pasture Regulation in terms of bovine units⁵

Type of animal	Bovine Unit
Culture breed dairy cow	1
Culture hybrid	0.75
Domestic cow	0.50
Veal-heifer (culture breed)	0.60
Veal-heifer (culture hybrid)	0.45
Veal-heifer (domestic)	0.30
Sheep	0.10
Goat	0.08
Buffalo (male)	0.90
Buffalo (female)	0.75
Ox	0.60
Lamb-goat	0.04
Bull	1.50
Horse	0.50
Mule	0.40
Donkey	0.30

⁵ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=5057&MevzuatTur=7&MevzuatTertip=5>

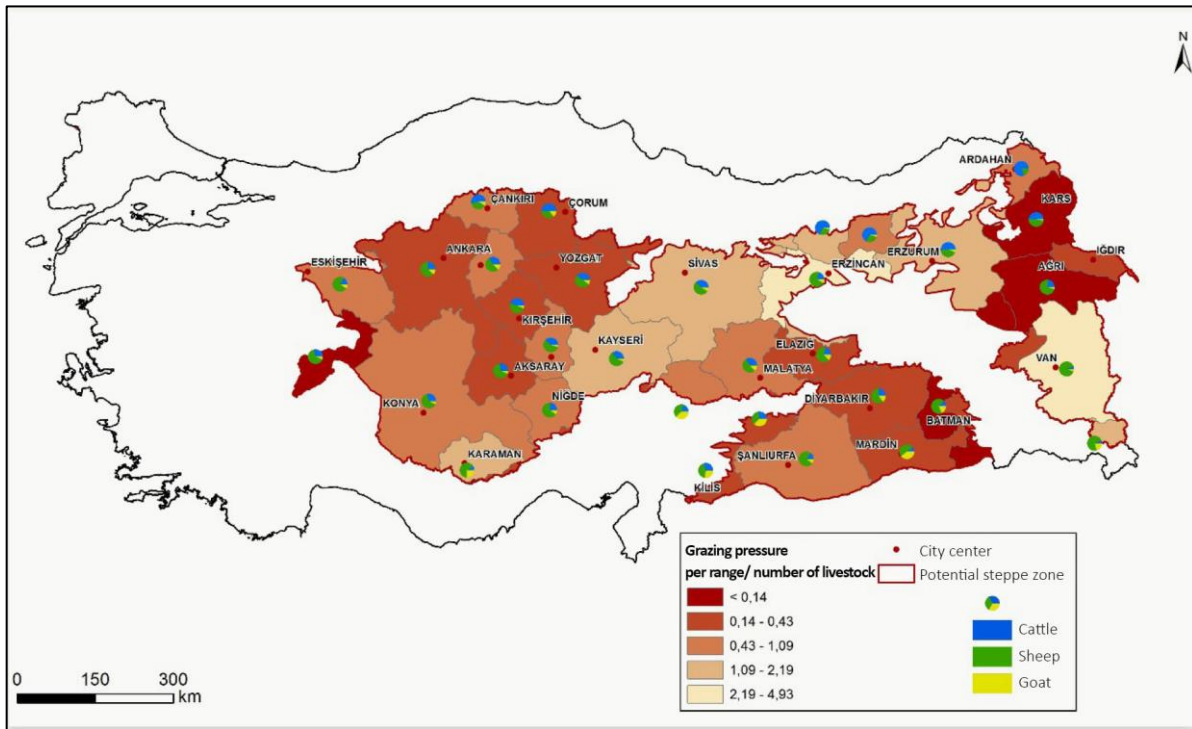


Figure 28. The Grazing pressure in the potential steppe zone of Turkey ©DKM

According to these evaluations, it is seen that among the provinces whose intersection with the potential steppe zone is >50%, the rangeland area per unit animal is the lowest in Ağrı, Kars, and Batman provinces (0.04 ha, 0.12 ha, 0.14 ha, respectively) (Table 16). This situation can be interpreted as that the intensity of rangeland use in these provinces is higher than in others. Van, Erzincan, and Sivas provinces stand out as the provinces with the highest amount of rangeland per number of animal (3.36 ha, 2.93 ha, 2.19 ha, respectively) and the use of rangelands is lower. When the amount of rangeland per unit animal in Şanlıurfa, which is the pilot province of the project, is compared with other provinces, it is seen that the grazing pressure on the rangeland is at moderate levels (0.65 ha). When these results are evaluated, it is seen that grazing pressure is more intense especially in provinces with limited rangeland areas. Especially in these provinces, it is important to prepare grazing plans and to implement practices for holistic grazing management.

Table 16. Unit amount of rangeland per unit animal number on the provincial basis.

Province name*	Geographical Region	Intersection with the potential steppe zone (%)	Unit rangeland/ total number of livestock **
Ağrı	Eastern Anatolia	99	0.04

Province name*	Geographical Region	Intersection with the potential steppe zone (%)	Unit rangeland/ total number of livestock **
Kars	Eastern Anatolia	93	0.12
Batman	Southeastern Anatolia	79	0.14
Ankara	Central Anatolia	86	0.19
Diyarbakır	Southeastern Anatolia	91	0.20
Mardin	Southeastern Anatolia	100	0.22
Çorum	Black Sea	61	0.27
Yozgat	Central Anatolia	89	0.35
Kırşehir	Central Anatolia	100	0.35
Iğdır	Eastern Anatolia	100	0.36
Elâzığ	Eastern Anatolia	80	0.38
Aksaray	Central Anatolia	100	0.43
Konya	Central Anatolia	86	0.61
Kırıkkale	Central Anatolia	100	0.64
Şanlıurfa	Southeastern Anatolia	100	0.65
Niğde	Central Anatolia	92	0.65
Nevşehir	Central Anatolia	100	0.73
Eskişehir	Central Anatolia	59	0.77
Ardahan	Eastern Anatolia	77	0.80
Çankırı	Central Anatolia	63	0.98
Malatya	Eastern Anatolia	88	1.02
Bayburt	Black Sea	98	1.08
Kayseri	Central Anatolia	90	1.22
Erzurum	Eastern Anatolia	64	1.25
Karaman	Central Anatolia	69	1.39
Sivas	Central Anatolia	82	2.19
Erzincan	Eastern Anatolia	66	2.93
Van	Eastern Anatolia	87	3.36
Muş	Eastern Anatolia	24	0.08
Afyonkarahisar	Aegean	35	0.09
Şırnak	Eastern Anatolia	24	0.10
Adana	Mediterranean	2	0.16
Tokat	Black Sea	14	0.19
Gaziantep	Southeastern Anatolia	29	0.20
Mersin	Mediterranean	2	0.22
Siirt	Southeastern Anatolia	25	0.26
Adıyaman	Southeastern Anatolia	39	0.28

Province name*	Geographical Region	Intersection with the potential steppe zone (%)	Unit rangeland/ total number of livestock **
Kilis	Southeastern Anatolia	39	0.30
Bitlis	Eastern Anatolia	28	0.42
Kahramanmaraş	Mediterranean	29	0.68
Bingöl	Eastern Anatolia	1	1.09
Giresun	Black Sea	9	1.24
Hakkâri	Eastern Anatolia	26	1.27
Tunceli	Eastern Anatolia	11	1.40
Artvin	Black Sea	4	1.89
Gümüşhane	Black Sea	43	2.00
Rize	Black Sea	2	4.93

*Provinces where the intersection of the province surface area with the potential steppe zone is <50% are shown in gray. Provinces where the intersection is lower than 1% are not shown.

** Grazing pressure: The amount of rangeland per unit number of animals prepared using a bovine unit. Coefficients for animal species are given in Table 15. Since the livestock statistics reflect the total in province, total rangeland size in the province has been used as the rangeland value regardless of the potential steppe zone, in order to make the assessment comparable.

3.2.2. Population Density

One of the greatest threats to the steppes is intensity of human activity. The activities such as expansion of settlements towards natural areas, new road and building activities directly threaten the steppes. There is no spatial data set that provides direct information on where and how much human activities have had an impact; therefore, the population data have been used as an indicator that can provide information about the intensity of human activities. It has been acknowledged that the pressure on natural areas will be higher in and around densely populated areas.

According to CORINE 2018 Land Use and Land Cover data, the spatial distribution of the settlements in the potential steppe zone in Turkey is given in

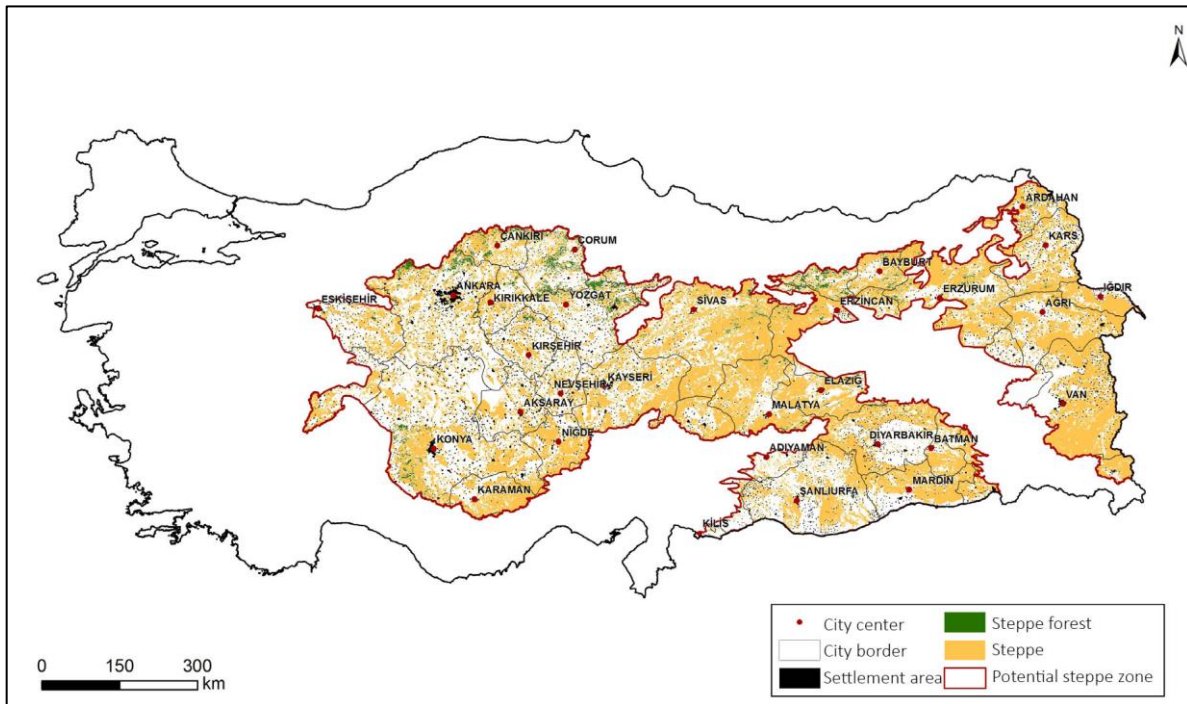


Figure 13. In order to assess the effects of population density on the steppes, the district and province data for 2019, which have been obtained from TURKSTAT, have been spatialized (Figure 29,

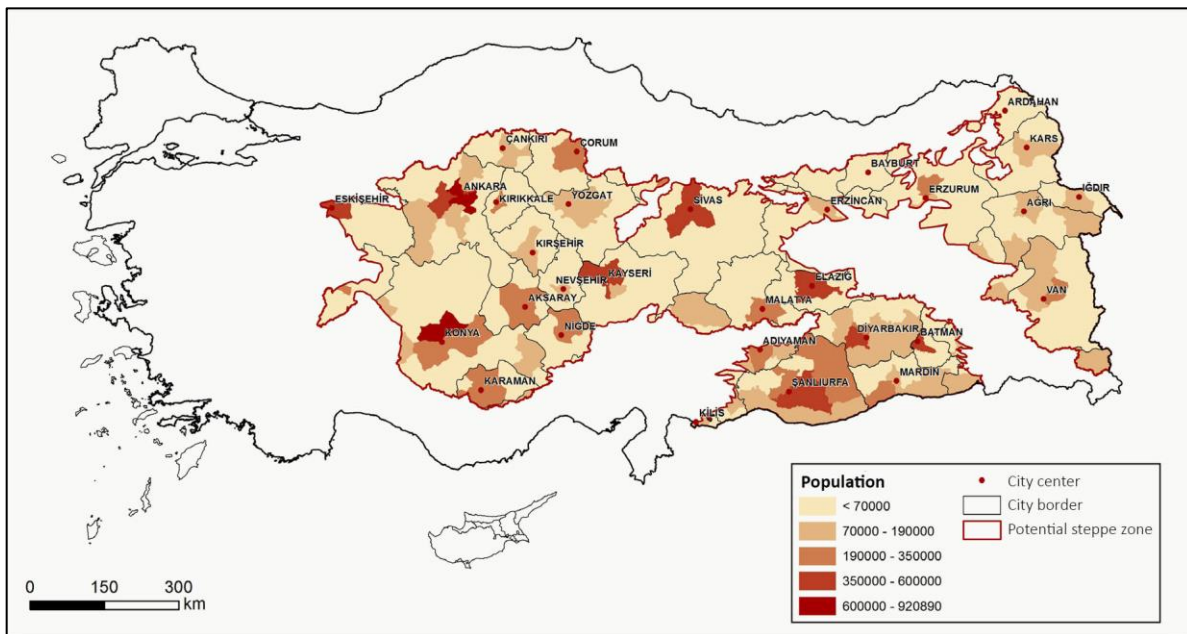


Figure 30).

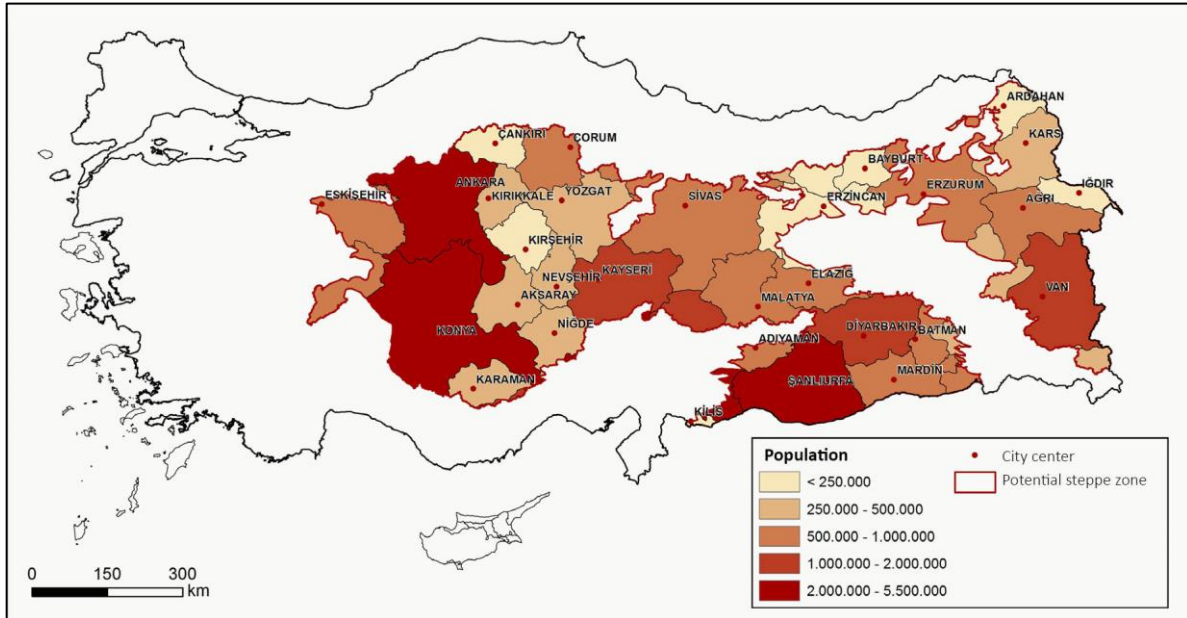


Figure 29. The population map by provinces within the potential steppe zone in Turkey ©DKM

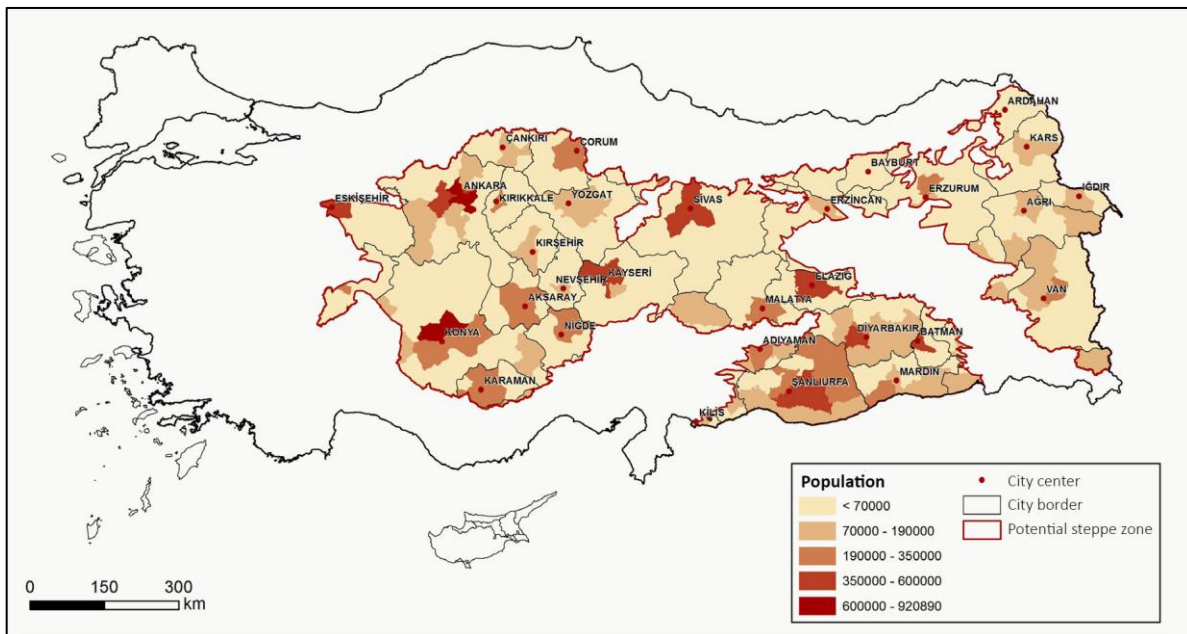


Figure 30. The population map by districts within the potential steppe zone in Turkey ©DKM

Furthermore, in order to examine human activities better spatially, an additional analysis was carried out using the night lights layer (Version 4, DMSP OLS) computed with visible spectra

and near infrared bands compiled from NOAA (National Oceanic and Atmospheric Administration)'s Meteorological satellite as an indicator of the intensity of human activities. According to these analyses, Ankara, Konya, Şanlıurfa, Diyarbakır and Kayseri stand out as the areas where the proportion of steppe area is high, and the population is dense. Therefore, these are the provinces where measures regarding human activity should be taken (

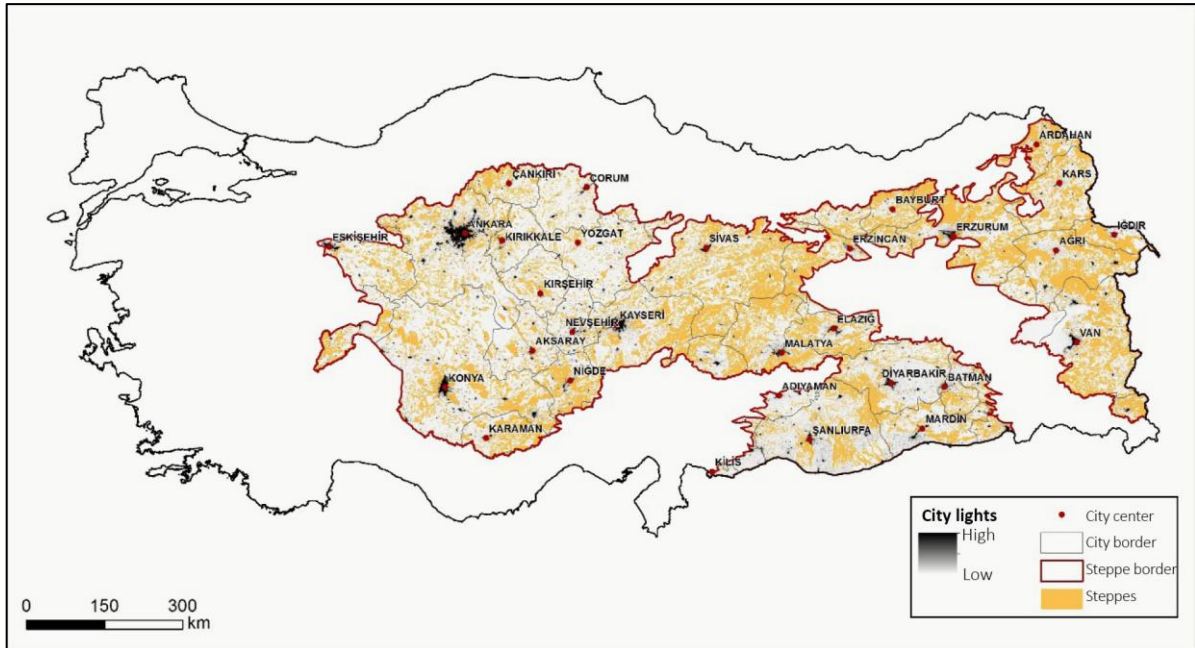


Figure 31, Table 7). These two analyses provide information on the current population density and urbanization. The issue of which areas the city will expand in the future is also important and should be taken into account while planning the conservation actions. Thus, it will be possible to make an effective plan, considering both present and future conditions. Steppe ecosystems are irreversibly destroyed as a result of urbanization pressure from new settlements. During the preparation of Environmental Plans, the value and importance of the steppe ecosystems should be emphasized, and a planning approach should be applied for the conservation and sustainable management of these habitats. Finally, there has been an increase in reverse migration in certain areas in recent years. However, since there is no spatial data on this threat that may cause the degradation of the vegetation cover of the steppe areas, it could not be mapped.

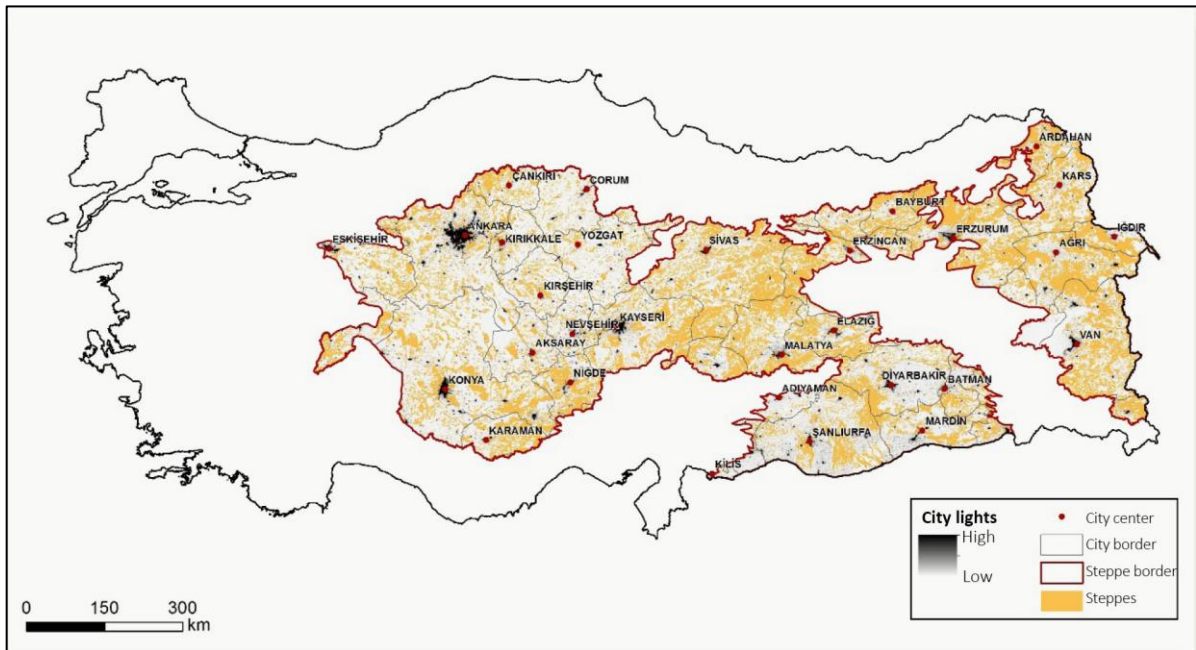


Figure 31. Spatial representation of the city lights of Turkey with the steppe areas ©DKM

3.2.3. Drought risk

Climate change is one of the most threatening factors for steppe ecosystems, like for all natural ecosystems. It is suspected that the steppe areas, which are already arid, will be threatened with further drought (semi desertification) due to the increase in temperature and decrease in precipitation in the future. Drought risk has been used for the determination of where the temperature (lowest and highest) and annual precipitation will change the most in 2070 compared to today. The future projections have been calculated using RCP 8.5, one of the IPCC 5th Assessment Report (2013) scenarios. Within this scope, the Emberger Aridity Index (Emberger, 1955) has been used⁶.

According to the Emberger Aridity Index, Konya, Şanlıurfa and Iğdır, today, stand out as the driest areas

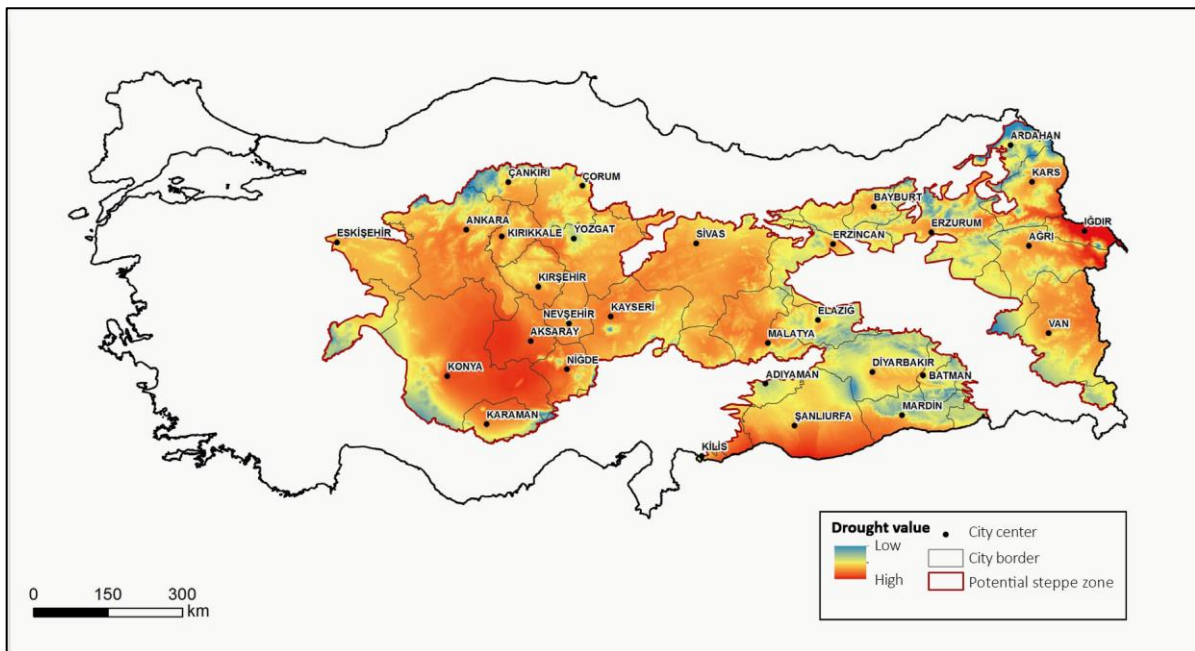


Figure 32). The climate classes determined according to the Emberger Aridity Index shows

⁶ The Emberger Aridity Index has been calculated using the variables; total annual precipitation, maximum temperature in the hottest month, minimum temperature in the coldest month according to the following formula:

$$2000 * BIO_{12} / ((BIO_5 - BIO_6) * (BIO_5 + BIO_6 + 546.24))$$

Bio12: Total annual precipitation (mm)

Bio5: Average maximum temperature of the hottest month

Bio6: Average minimum temperature of the coldest month

For calculating the Emberger Aridity Index, the climate surfaces from the WorldClim (<https://www.worldclim.org/bioclim>) database have been used.

that, most areas inside the border of potential steppe area are in the semi-arid (22,136,089 ha) climate class. Arid areas cover 218,933 ha, while semi-temperate areas cover 11,178,386 ha. The driest region stands out as Iğdır (

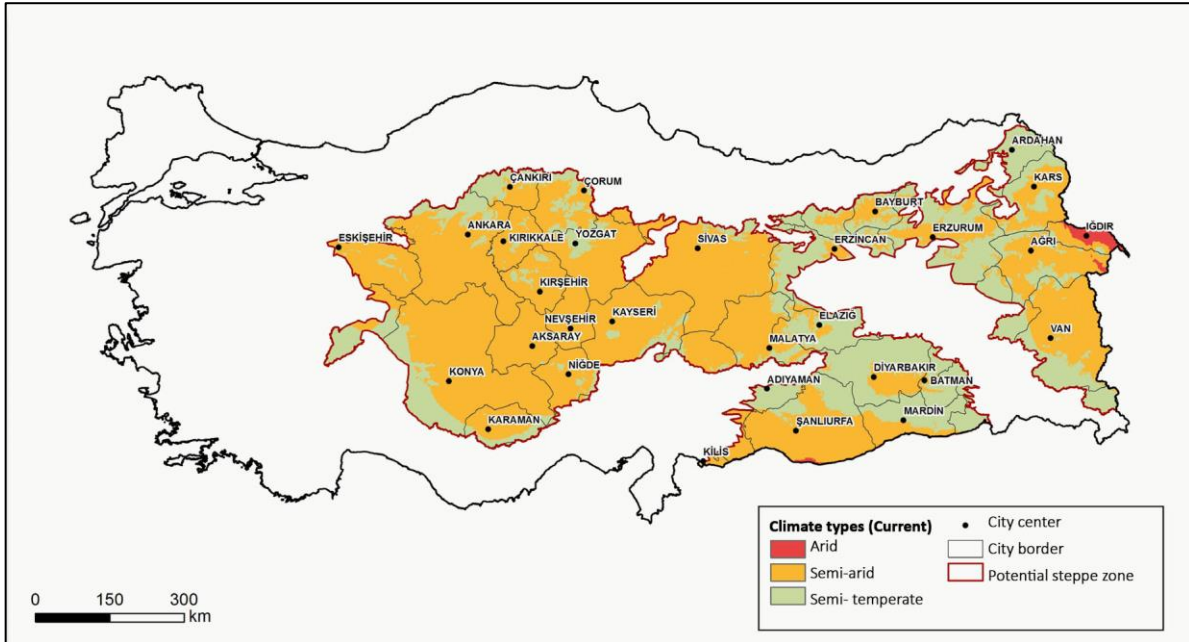


Figure 33).

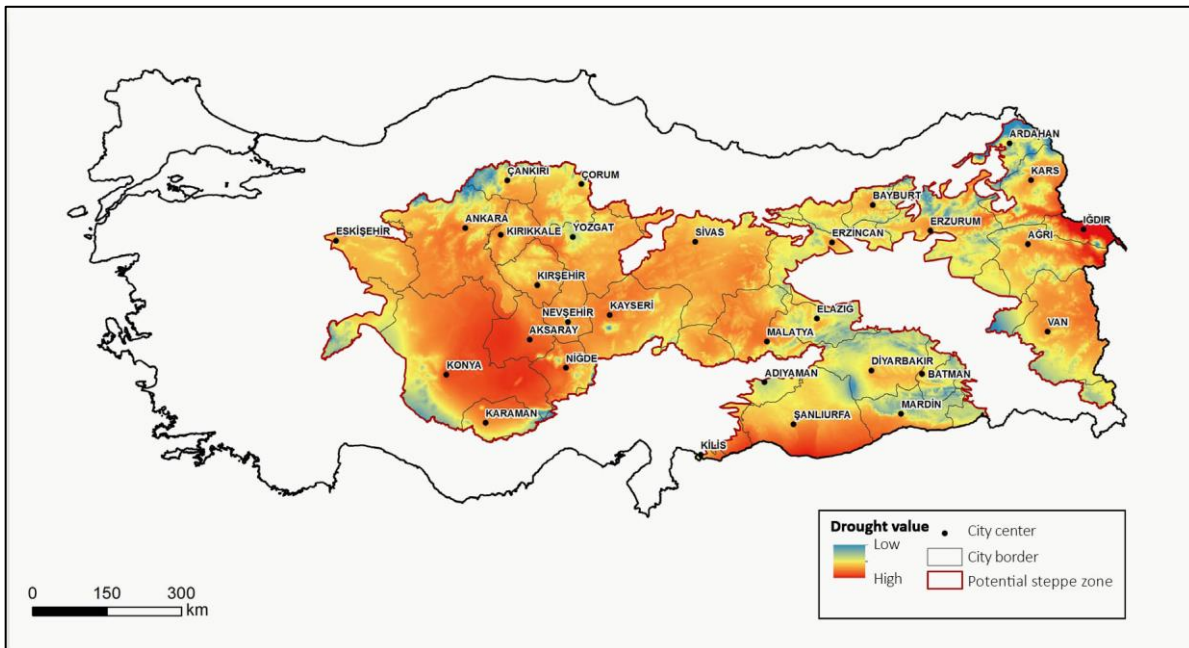


Figure 32. The current drought values according to the Emberger Aridity Index ©DKM

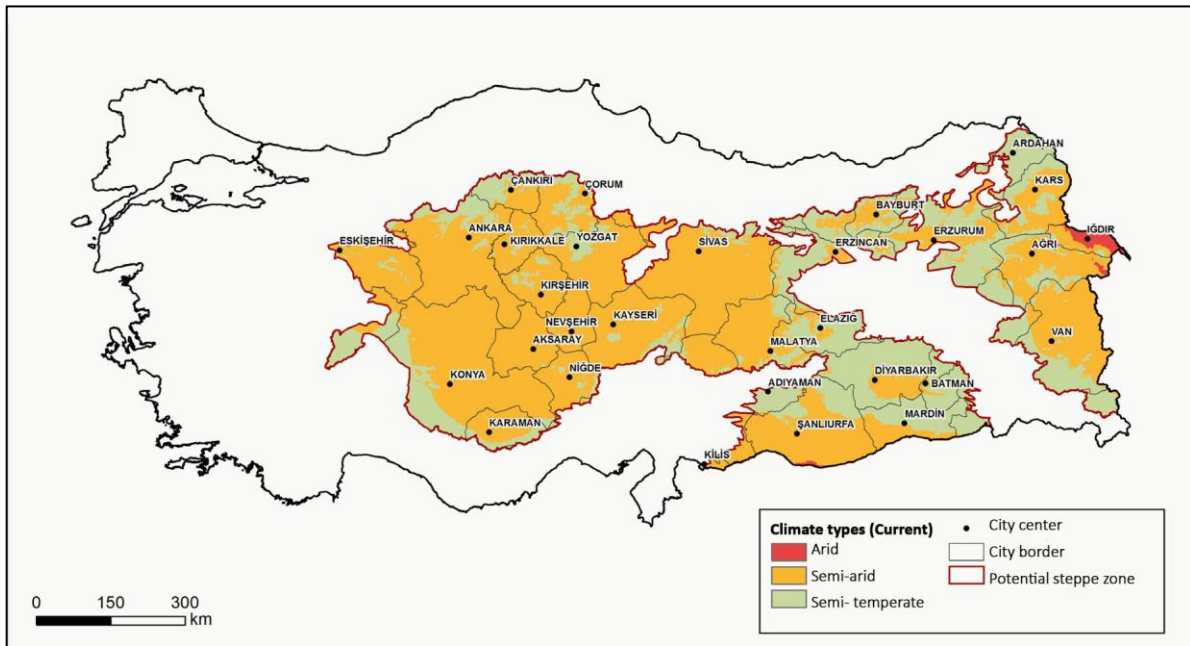


Figure 33. Current climate types within the potential steppe boundary calculated according to the Emberger Aridity Index ©DKM

According to the scenarios for 2070, in all provinces within the potential steppe zone an increase of 3-24% in drought is foreseen in the future (

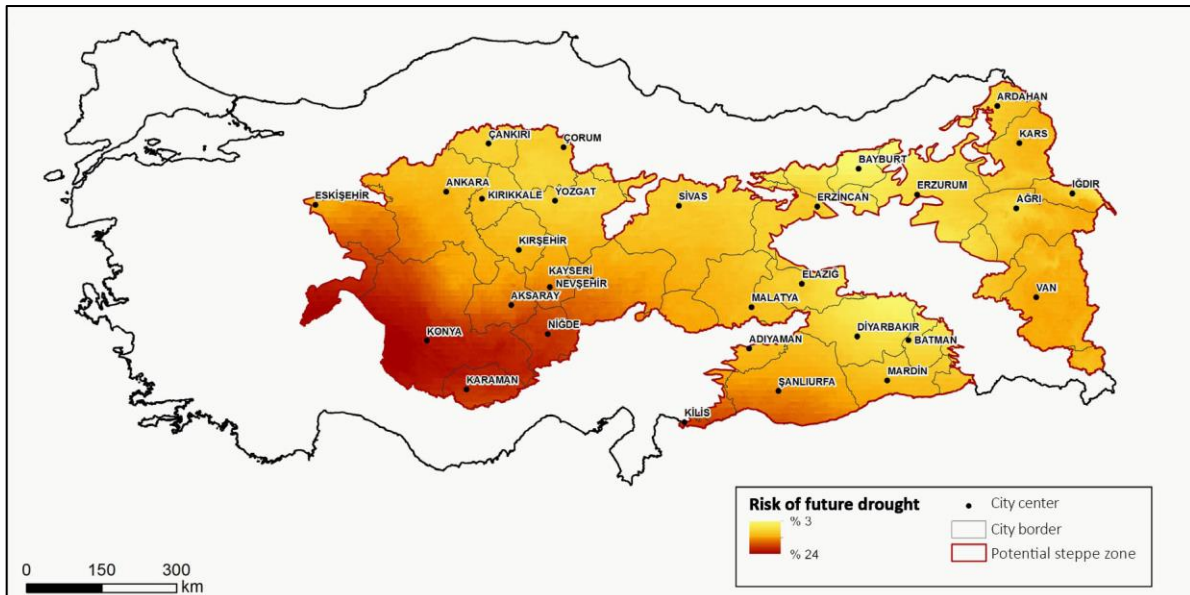


Figure 34). The areas where the drought increase will be most severe are on the Afyonkarahisar-Konya-Karaman-Niğde line. It is observed that the drought increase is also high in the districts in the south of Şanlıurfa. When an assessment is made according to the future climate classes, it is predicted that the southeast of Konya, Karaman, Aksaray, Niğde and some

parts of Şanlıurfa will transition from semi-arid climate to arid climate. In future projections, dry areas are expected to expand to 2,506,675 ha, and semi-arid areas are expected to cover 26,132,972 ha. A decrease is also projected in areas covered by semi-temperate areas. These areas, which cover 11,178,386 hectares in today's classification, are expected to fall to 4,893,761 hectares in future scenarios. It is predicted that the part of Afyon within the potential steppe boundaries and the areas in the southwest of Konya will transition from semi-temperate to semi-arid climate (

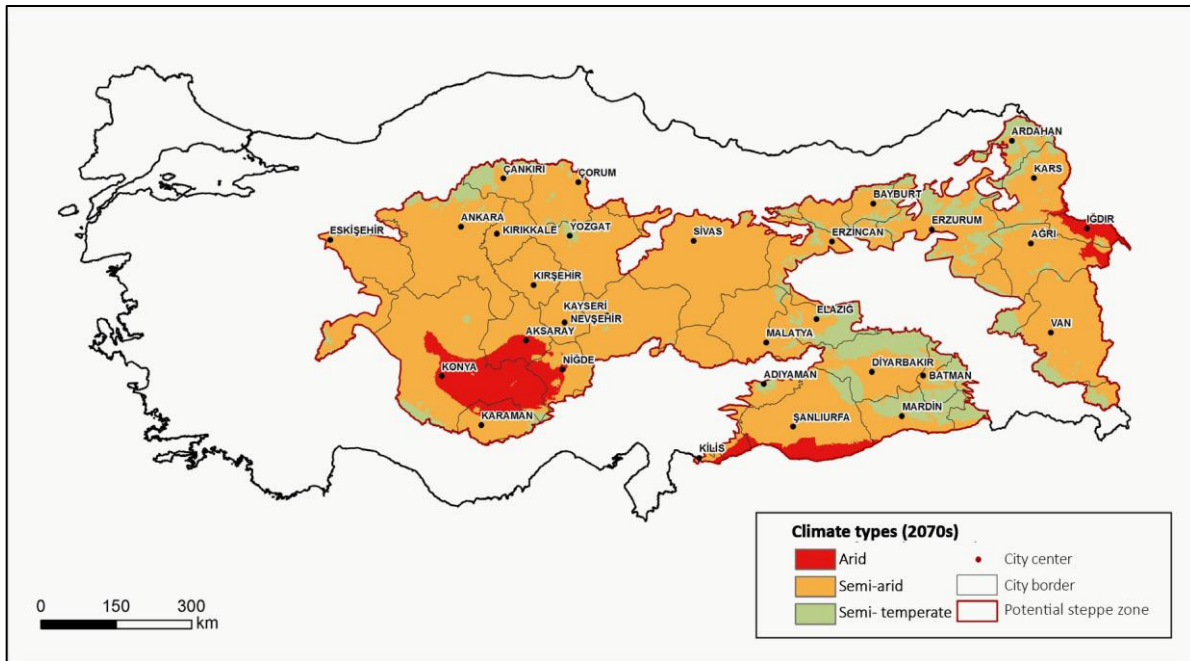


Figure 35). Konya and Şanlıurfa are among the provinces where the steppes cover a large area and where the steppes are represented as protected areas. For management of both the steppes within the boundaries of protected areas and the steppe areas that do not have any legal status, it is important to start taking precautions regarding the anticipated drought in the future.

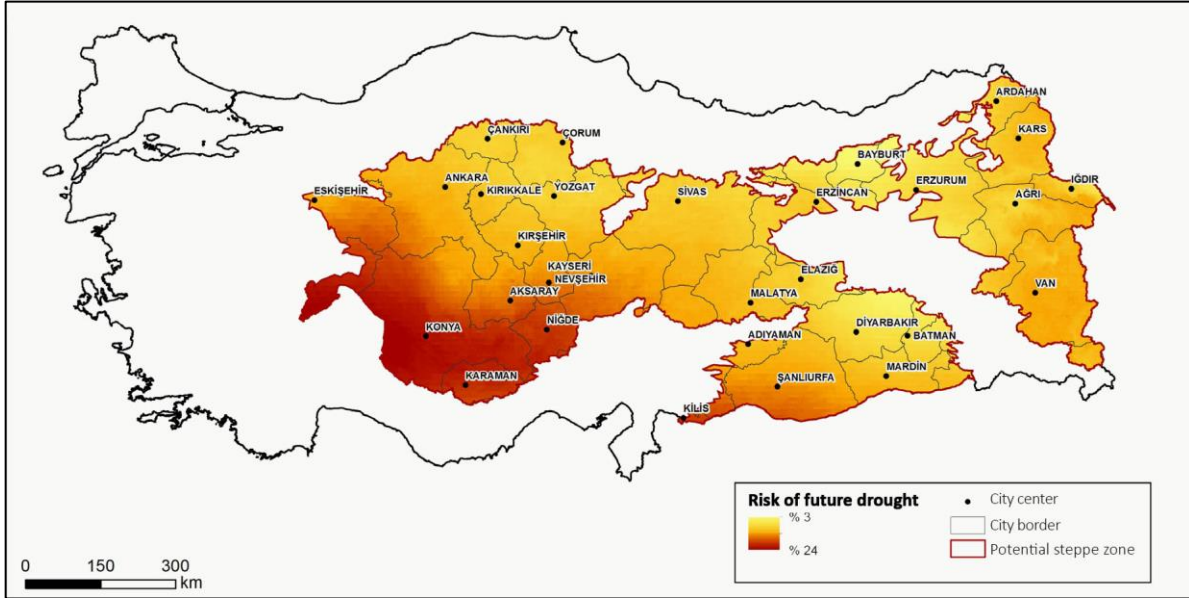


Figure 34. Change in the drought risk in 2070 according to the Emberger Aridity Index ©DKM

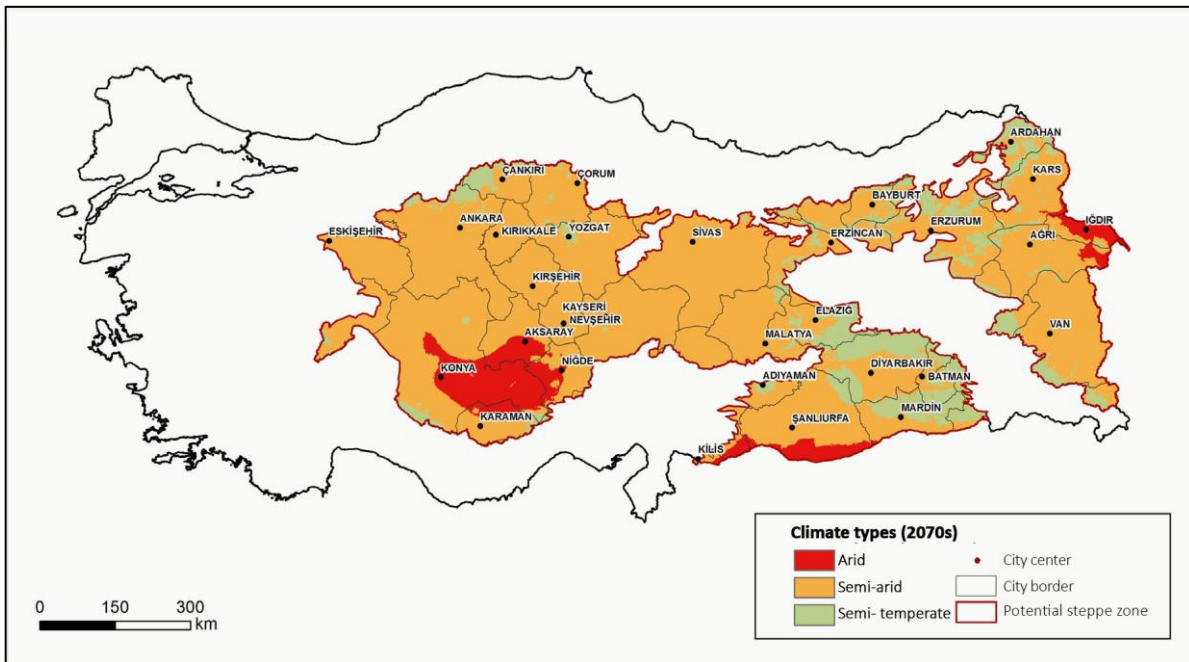


Figure 35. Future (2070) climate classes within the potential steppe boundary calculated according to the Emberger Aridity Index ©DKM

3.2.4. Erosion Risk

Erosion risk is also one of the important threats that affect both steppe ecosystems and other natural ecosystems. In Turkey, there are erosion risk models (GDCDE, 2017) but within the scope of this assessment they could not be used because the spatial data could not be obtained. In this context, in order to address the erosion risk on the steppe ecosystems, the outputs of the Rusle-based Global Erosion Model with coarser resolution have been used (Borrelli et al., 2017). According to this model with a resolution of 25 km, Diyarbakır, Mardin, Batman, Erzincan, Ardahan, Kars and Van are the areas with high erosion risk (

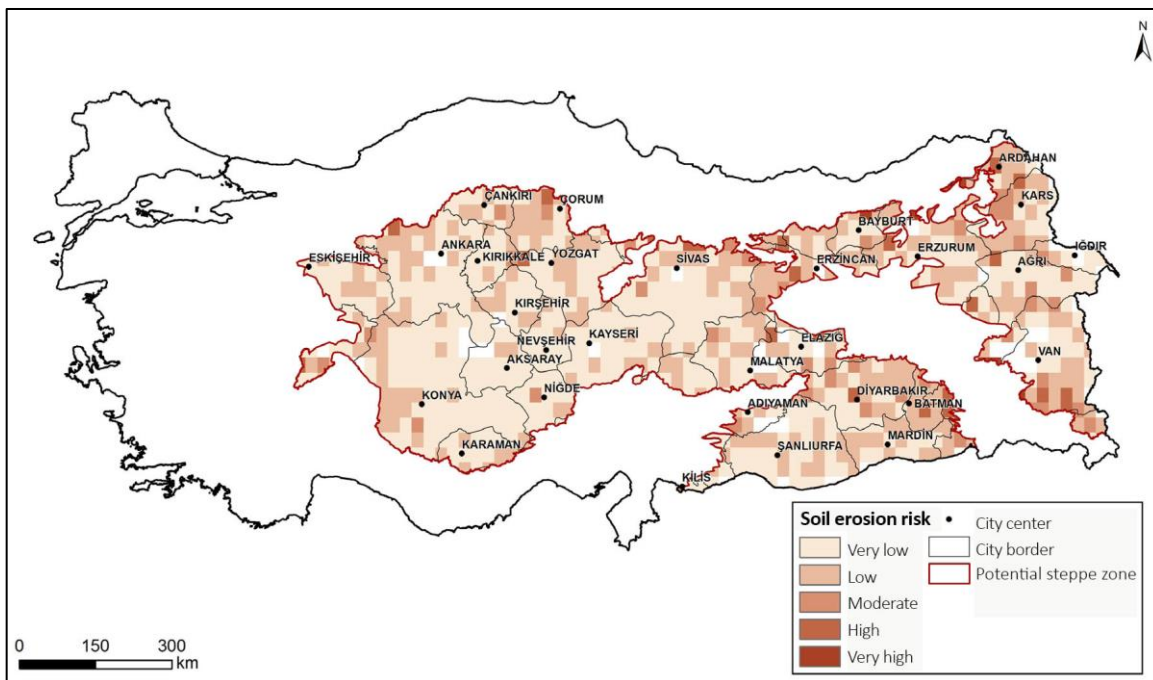


Figure 36). Among these, Van, Erzincan and Ardahan are the cities where especially the steppes are used as rangeland and where the livestock is dense. In this context, it is very important to carry out the rangeland improvement activities to reduce erosion in these provinces. These evaluations are made with the outputs of the rough scale global erosion model. Using higher resolution erosion risk data is important in addressing the erosion threat on the steppes.

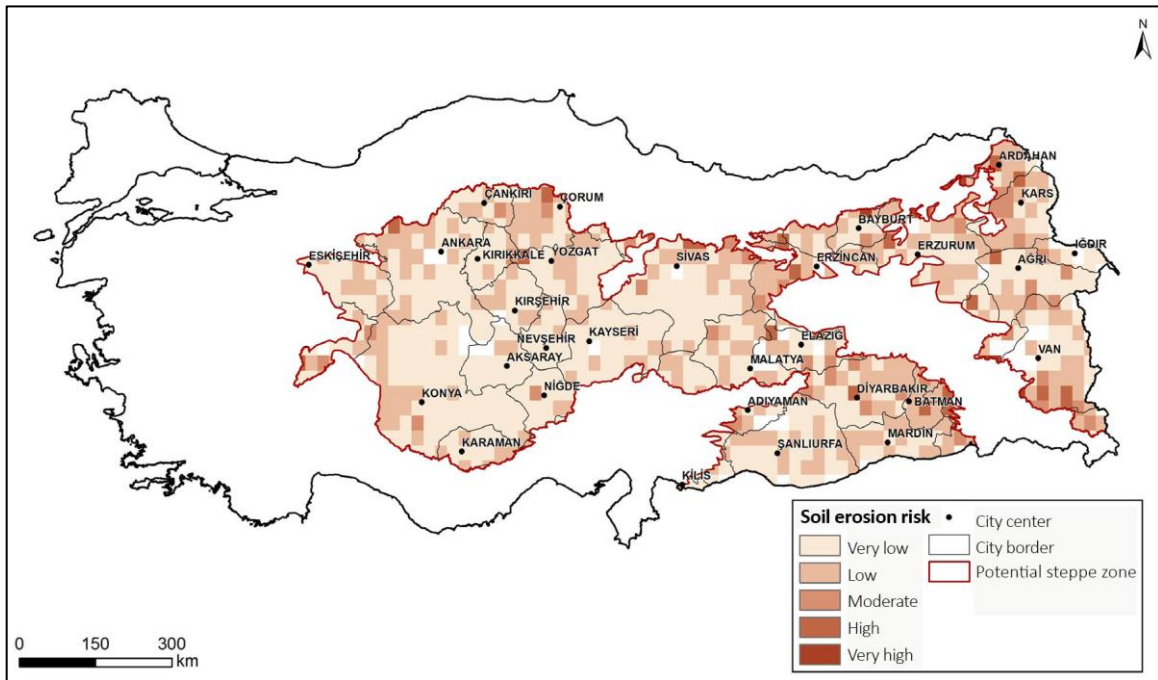


Figure 36. National erosion risk in line with the outputs of the Rusle-based Global Erosion Model ©DKM

In this part of the strategy, the spatial evaluations of Turkey's steppes are made and the current situation of the steppes and the threats to them are analyzed spatially. When the threats to the steppe areas are assessed together, it is seen that the threats are mostly dense on the steppes in Konya, Diyarbakır, Şanlıurfa, Van and Ankara. Ağrı also stands out as a province with high grazing pressure, since in Ağrı the rangelands are limited but the number of livestock per unit of rangeland is high. For these provinces and other areas where the steppe cover is dense, studies for the conservation and sustainable management of the steppes are becoming increasingly important. Within this context, this strategy and action plan has been prepared in order to reduce the threats to the steppes and to define conservation and sustainable development goals.

4. National Steppe Conservation Strategy

National Steppe Conservation Strategy and Action Plan includes a conservation strategy adopted by all parties for the steppes and the actions to achieve the goals and objectives of this strategy. This strategy and action plan provides a framework that can be renewed and updated as the goals are achieved, and the conditions change.

While preparing the Turkey Steppe Conservation Strategy and Action Plan, the international conventions and programs, laws and regulations, policy documents, strategy, action plans and relevant legislation related to the steppe ecosystems were examined and integrated into this study.

The general goal of the National Steppe Conservation Strategy is to ensure the sociological, ecological and economic sustainability of the steppes. The strategy defines the goals and objectives for the conservation of the steppes in line with this main goal.

4.1. Strategic Goals and Objectives for the Conservation of the Steppes

Four strategic goals and 12 strategic objectives under these that consider the current situation of the steppes, spatial evaluations regarding the steppes, and the policies, legislation, and practices related to the steppes constitute the general framework of the strategy.

The strategy adopts an approach that includes processes ranging from the governance of the steppes to the monitoring and complementing each other. With this approach, the first strategic goal is to create a co-operative environment and develop policies, which is one of the most important needs for the effective management of the steppes. The second one of the strategic goals is to ensure the conservation of steppe biodiversity in relation to the objectives of the Convention on the Biological Diversity and the National Biodiversity Strategy and Action Plans (2007 and 2018-2028), and the third one is to improve the use of resources in the steppes within the framework of the sustainability principle. The fourth strategic goal is to improve the livelihoods of the local people who benefit from the steppes. Increasing the welfare level of the local people, who benefit from the steppes, as well as other strategic goals, is one of the desired results in the long run. The strategic goals and objectives are given below.

STRATEGIC GOAL 1. Creating a cooperative environment and developing policies to ensure effective management of the steppes

Objective 1.1. Development and implementation of a governance model for the steppes

Objective 1.2. Strengthening the legal and administrative structure for the conservation and effective management of the steppes

Objective 1.3. Developing research, monitoring and technology capacity for the conservation and effective management of the steppes

STRATEGIC GOAL 2. Conservation of the steppe biodiversity (at the levels of ecosystem, species, genetic and ecological process diversity)

Objective 2.1. Conservation of the steppe ecosystems

Objective 2.2. Conservation of the steppe species and their habitats

Objective 2.3. Conservation of the genetic resources of steppes

Objective 2.4. Increasing the adaptation capacity of the steppes to climate change

Objective 2.5. Introducing the biodiversity value of the steppes and increasing its visibility

STRATEGIC GOAL 3. Improving the use of resources in the steppes within the framework of the sustainability principle

Objective 3.1. Disseminating agricultural practices supporting steppe biodiversity

Objective 3.2. Ensuring sustainable and ecosystem-based rangeland management

STRATEGIC GOAL 4. Improving the livelihoods of the local people who benefit from the steppes

Objective 4.1. Establishing the essential environment to increase the added value of plant production and animal husbandry practices in the steppe and related areas and their benefits to the local people

Objective 4.2. Diversifying and supporting the income-generating activities for local people based on sustainable utilization of steppes

4.2. Situation Assessment for the Strategic Goals and Objectives (SWOT)

The method of SWOT Analysis has been used to comprehend the current situation regarding the conservation and management of the steppes. SWOT (Strength-Weakness-Opportunities-Threats) Analysis is a technique used to determine the strong areas of an institution, system, individual or service, which are open to improvement, and the opportunities and threats faced by them in the external environment. “Strengths” and “Opportunities” are classified as positive issues, while “Weaknesses” and “Threats” are classified as issues that require attention.

The current situation regarding the conservation and management of the steppes on the national scale is evaluated below as strengths and weaknesses, opportunities and threats. This evaluation is reflected in the strategy and action plan on the basis of objectives and actions (Table 17).

Table 17. SWOT Analysis for the Steppes (Strengths and Weaknesses, Opportunities and Threats)

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Presence of the natural steppes • Existence of the national and global protected area statuses and protected areas • Biodiversity values, rich cultural heritage and originality of the steppes • Existence of the legislation on rangelands, soil conservation and land use • Priorities and measures regarding the conservation and management of biodiversity in the national policy documents • Having all authorities and responsibilities related to nature conservation, rangelands and agricultural fields gathered under a single ministry and having a strong local organization structure • Having a custom of cooperative working between the organizations 	<ul style="list-style-type: none"> • Lack of awareness about the importance of the biodiversity of the steppes • The steppes being considered as unclaimed • Lack of a law and institution related to the conservation and management of steppes • Incomplete determination of the current steppe areas • Underrepresentation of the steppes in the protected areas system • Inadequate implementation and monitoring of cooperation (data, information management and sharing) between different institutions for the conservation and management of steppes • Insufficient monitoring of the steppe species and habitats • The not registered areas in land registry not being registered as steppes • Conflict of authority and responsibility between the relevant institutions for the conservation of steppes • The absence of penal sanctions in the Pasture Law, actually non-implementation of the

<ul style="list-style-type: none"> • Having research, monitoring and technology development infrastructure • Presence of eco-friendly agricultural practices and support programs • Presence of awareness of the problems of and threats to the steppes and the initiation of the strategy process • Presence of many ongoing studies and projects (such as the Provincial Biodiversity Inventory and Monitoring Project and the Conservation and Sustainable Ecosystems Management of Turkey's Steppe Project) which take the steppe biodiversity in the region into account 	<p>legislation as the allocation procedures could not be completed, and the lack of coordinated regulations regulating grazing among the relevant laws</p> <ul style="list-style-type: none"> • Allocations being made to the settlement instead of the private or legal person, the availability of every resident's right to grazing, and the presence of uncontrolled nomadic animal husbandry • Ineffective work of rangeland management unions • Absence of a legislation on increasing efficiency through creating a Rangeland Legal Entity, in the Pasture Law practices and conservation of rangelands • Insufficient sharing of authority, power and responsibility at the local level and uncertainties in administrative limits and powers for the conservation of rangelands • Lack of consideration of biodiversity elements during the rehabilitation works in rangelands • Lack of a training and awareness-expanding programs on the steppes for different interest groups • Insufficient agricultural policies, incentives and supports for the conservation of steppe areas and biodiversity • Inability to realize climate friendly and protected agricultural practices supporting steppe biodiversity beyond the model practices
<p>OPPORTUNITIES</p>	<p>THREATS</p>
<ul style="list-style-type: none"> • Biodiversity-oriented international commitments and 2030 goals • Presence of the strong non-governmental organizations on environmental and nature conservation • Presence of universities and institutes conducting research on the steppe areas and their biodiversity • Presence of the national and international projects 	<ul style="list-style-type: none"> • Overuse of the natural resources due to the rural poverty, intensive agriculture and animal husbandry • Policies supporting use rather than conservation • Out-of-purpose use requests and political pressures on land uses • Bio trafficking and increasing threats to genetic resources

<ul style="list-style-type: none"> • Increase in the awareness of deterioration (drought, species extinctions) • Presence of the traditional, sustainable rangeland use principles 	<ul style="list-style-type: none"> • Increase in the number of settlements due to migration and population growth • Regional differences, and resilience of the socio-cultural structure at the local level against the changes required for sustainable resource management • Abandonment of the traditional and sustainable practices with changing socio-cultural structure • Adverse effects of climate change and drought • Increasing pollution due to the industrial facilities • Increase in the investment demands for steppe ecosystems (quarries, mining, transportation networks, etc.)
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Gap Analysis

A gap analysis constitutes a baseline for preparation of national level steppe conservation strategy and action plan. The analysis used multifaceted methods and approaches, and provided key results which are reflected in the different parts of the strategy and action plan document.

The gap analysis includes following studies;

- i) An assessment on current situation regarding the policies, legislation and mechanisms as well as institutional structure and capacity at the national level related to conservation and sustainable management of the steppes. Given in **Section 2.8 The Legal Framework and Institutional Structure Related to Steppes**.
- ii) A spatial assessment on current situation with respect to conservation of steppes specifically in protected areas and important biodiversity areas, with attention to the distribution of steppes and steppe forests related to geographical regions and provinces; and threats to and pressures on the steppes of Turkey. The study is based on a desk study as well as outcomes of the workshops and meetings. Given in **Section 2. The Steppes of Turkey** and **Section 3. The Spatial Assessments Regarding the Steppes of Turkey**.
- iii) A SWOT Analysis used as a tool for analysis of internal (strength and weakness) and external factors (opportunity and threat) affecting the conservation and management of steppes at national level. The study is based on outcomes of the workshops and meetings. Given in **Section 4.2. SWOT Analysis of the Strategic Goals and Objectives**.

Key results of the gap analysis:

- *Policies, legislation and mechanisms:*

There is no definition for steppes in the legislation as for forests and wetlands. The steppe ecosystems of Turkey comprise natural steppes, meadows, rangelands and degraded forests of steppic nature which are managed by different institutions with regards to different laws and regulations. Although there is no single institutional structure responsible for the conservation and management of the steppes, there is the capacity and various mechanisms distributed within different institutions. Based on these findings, a further assessment is provided to demonstrate a scheme for institutional structuring at national and local level with regards to conservation and management of steppes. Besides, overlaps and gaps in key issues were revealed by examining legislation together with duties and responsibilities of the institutions. These results all revealed the importance of governance and collaboration mechanism for sustainable management of the steppes which are addressed under Strategic Goal 1.
- *Distribution Mapping and Spatial Assessment:*

The outcomes of these assessments revealed that the region of steppe and steppe forest ecosystems in Turkey (areas that form sparse or closed forests, within the ecological regions dominated by steppes) cover an area of approximately 33.5 million hectares. According to the analyses, there are approximately 17 million ha of steppe area and

forest within the potential steppe zone. Of the 17.5 million ha, 42% is in Central Anatolia, 36% is in Eastern Anatolia, 14% is in Southeastern Anatolia, 5% is in the Black Sea region, 2% is in the Mediterranean region and 1% is in the Aegean Region. In the region with potential steppe and steppe forests of Turkey, there are 75 protected areas of legal status and approximately 4% of 33.5 million hectares is under protection. Of steppe and steppe forests (about 17.5 million ha) within the potential steppe zone, 2.9% is legally protected.

- *SWOT Analysis*

The presence of natural steppes and their biodiversity, existence of core legislative and administrative mechanisms, and existing studies were strengths whereas lack of perception of steppes importance, inefficient governance, coordination and cooperation issues, difficulties regarding the pasture law were weakness foremost indicated. The international commitments, presence of NGOs, universities and existing studies were opportunities while overuse of natural resources and policies supporting use rather than conservation, increase of settlements and investments, impact of climate change and drought were external threats indicated. The outcomes of the analysis constituted a basis for formulation of the strategy.

5. National Steppe Conservation Action Plan

The National Steppe Conservation Action Plan includes the actions to achieve the determined strategic goals and objectives. The timetable for the realization of the actions within the scope the Action Plan is determined as 2021-2023 (short term), 2021-2026 (medium term) and 2021-2030 (long term). For each action to be carried out, responsible and relevant institutions for that action are specified. The purpose of specifying both responsible institutions and relevant institutions is to emphasize the importance of cooperation between the institutions in order to successfully implement relevant activities and to be a guide in this regard.

In addition, for the monitoring and evaluation of the action plan and revision when necessary, both a higher set of indicators for objectives and indicators for actions and the start and end values of these indicators are given.

5.1. Actions to Achieve the Strategic Goals and Objectives

Priority and strategically important issues in line with the actions determined to achieve the strategic goals and objectives are given below.

5.1.1. Strategic Goal 1

Creating a cooperative environment and developing policies to ensure effective management of the steppes

Strengthening the legal and administrative structure in addition to the development and implementation of the governance model that can support for the conservation of the steppes, managed within the powers and responsibilities of different institutions, within the scope of different laws and regulations are among the most basic needs.

The main coordination of the National Steppe Conservation Strategy and Action Plan will be carried out by the "Sub-Committee for the Execution of the Contract on the National Basis" under the National Biodiversity Coordination Board. A Commission can be established by this Sub-Committee to ensure effective participation in the decision-making processes regarding the steppes and to act as an advisory board regarding the authorities and responsibilities of the institutions. This commission is expected to take an active role in the implementation, monitoring and evaluation of the strategy and action plan. For the implementation of the

governance mechanism, it is important to develop cooperation and ensure effective communication between relevant institutions and stakeholders. Making the necessary arrangements for the gaps in the existing legal and administrative structure and establishing new legal structures and regulations are priority issues. In these matters, some action recommendations will be given, as well as analyzing the legislation and institutional structure related to biodiversity and protected areas will provide an important tool to support the conservation of steppe biodiversity.

In addition, the actions to meet the capacity needs in human resources, research, monitoring and technology that can contribute to the conservation and management of the steppes are defined.

The indicators determined at the level of objectives are given below:

- i) An effective governance mechanism*
- ii) The number of legal and administrative regulations based on the effective management of the steppes (number)*
- iii) The change in the number of data and information production, sharing and use associated with steppes (percentage)*

5.1.2. Strategic Goal 2

Conservation of the steppe biodiversity (at the levels of ecosystem, species, genetic and ecological process diversity)

In the Convention on Biological Diversity and national policy documents, conservation of biodiversity, its sustainable use and fair sharing of the benefits arising from the use of genetic resources are the most basic principles. In this strategy and action plan, conservation of the steppe ecosystems, species and habitats, and genetic resources are priority objectives of strategic importance. In this context, the conservation proposals regarding biodiversity are handled separately under the first two objectives. In the first one, it is to increase the area of protected areas including priority steppe areas, to develop conservation proposals by evaluating different study results (e.g. Sites of Importance identified as a result of the National Biodiversity Inventory and Monitoring Project, Systematic Conservation Planning (SCP) Conservation Priority Areas, Prime Butterfly Areas (PBAs), candidate Natura 2000 areas, Key Biodiversity Areas (KBAs), Important Plant Areas (IPAs), Important Bird Areas (IBAs), etc.), to monitor Sites of Importance including steppe areas, and to determine ecological corridors. As for the second one, main actions are determining the priority steppe species and their habitats, preparation, implementation and monitoring of species action plans, especially for

steppe-specific/specialized species, and conservation of steppe species and habitats in the existing protected areas in cooperation with the local people. Recording the plant and animal species in the steppes that may be important in terms of genetic resource quality and conserving them ex-situ, as well as recording traditional information and sharing innovations and practices in this regard are recommended. It is important that the realization of these actions through participatory processes that will ensure cooperation between relevant institutions and stakeholders and the active participation of the local people. In addition, legal and administrative regulations at the national level that will support the conservation of steppe biodiversity will contribute to the creation of a suitable environment to achieve these goals.

The importance of increasing the adaptation capacity of steppe ecosystems, one of the most sensitive ecosystems, to climate change is demonstrated in international conventions and national policy documents. Identifying and monitoring the possible effects of climate change on the steppe ecosystems, developing adaptation proposals accordingly, preparing adaptation plans, accomplishing implementations, creating and implementing monitoring programs are the main actions.

Based on the Convention on Biological Diversity and national policy documents, creating awareness about the biodiversity values and the conservation and sustainable use of biodiversity is defined as one of the priority objectives. The steppe interest groups' knowledge and awareness about the steppes and their biodiversity values is one of the basic principles to ensure their participation in the process. In this direction, actions are defined to create the physical infrastructure that will contribute to the promotion, information, communication, and training activities to increase awareness about the biodiversity value of the steppes, to provide synergy with relevant practices, and to disseminate good examples.

In addition, the national and regional tourism plans and programs are considered as an important opportunity for nature tourism and ecotourism practices for the sustainable use of the steppes and their biodiversity. Planning and implementing all these actions in cooperation with relevant stakeholders is also highlighted.

The indicators determined at the level of objectives are given below:

- i) Change in surface area of the steppe areas (percentage)*
- ii) Change in surface area of the protected steppe areas (percentage)*
- iii) Effective management of protected steppe areas (percentage)*
- iv) Number of effectively protected steppe species (number)*

- v) *The number of steppe species that are effectively protected for genetic resources (number)*
- vi) *The number of applications regarding adaptation to climate change (number)*
- vii) *Number of persons reached regarding the promotion and visibility of steppes (Number of persons)*

5.1.3. Strategic Goal 3

Improving the use of resources in the steppes within the framework of the sustainability principle

In the international covenants, the importance of promoting the sustainable resource management is emphasized. Main objectives are creation and dissemination of agricultural production and support models that support the steppe biodiversity for sustainable resource use in the steppe areas, and provision of sustainable and ecosystem-based rangeland management. Most important tools in realizing these strategies are to promote cooperation between relevant institutions and stakeholders and to ensure that the local people take an active part in sustainable use and management of resources.

In this context, establishing and disseminating exemplary support programs for eco-friendly agricultural practices and supporting and disseminating the agricultural practices that support the steppe biodiversity are handled primarily. Exemplary programs and applications such as ÇATAK and IPARD on this subject provide an important tool. In addition, support and incentive mechanisms that will ensure the implementation and continuity of biodiversity friendly agricultural practices, especially in priority steppe areas and their surroundings, are defined.

Priority actions for the conservation of the steppes, most of which are used as rangelands, and for sustainable and ecosystem-based rangeland management are as follows: Planning rangeland improvement activities in a way to take into account biodiversity factors, addressing rangeland improvement works with the rangeland management projects as a whole, monitoring the rangeland improvement activities more effectively, and developing, supporting and disseminating best practices for sustainable and regenerative rangeland management. In particular, the planned sample application with the cooperation approach, pilot, and demonstration projects are important tools for the implementation of sustainable and ecosystem-based rangeland management. In addition, legal and administrative regulations at the national level that support the conservation and sustainable management of rangelands will contribute to the creation of an enabling environment to achieve this goal.

It should be taken into consideration to solve the settlement and education problems of nomadic families from fragile groups living in the steppe areas and to encourage and support income-generating practices for the nomads.

The indicators determined at the level of objectives are given below:

- i) *Change in agricultural practices that support biodiversity (number of farmers or area of land)*
- ii) *Change in surface area under sustainable and ecosystem-based rangeland management (percentage)*

5.1.4. Strategic Goal 4

Improving the livelihoods of the local people who benefit from the steppes

Increasing the awareness of the local people on steppe biodiversity and encouraging them to take part in the sustainable use of steppe resources effectively are the basic principles for the conservation of steppe biodiversity. Supporting the traditional, sustainable natural resource use of the local people whose livelihood is based on the steppe ecosystem is handled primarily. In this context, one of the most important steps is to increase the added value of plant production and animal husbandry practices in the steppe and related areas. Accordingly, making basic socio-economic researches in priority steppe areas and obtaining information on the fragile groups will provide an important basis for all studies on the livelihoods. As one of the most important tools for the success of these works, supporting the organization and cooperatives in rural production in the steppes and related areas is important.

Within the scope of the first objective, conducting socio-economic research, value chain analysis and geographic marking studies to increase productivity and added value are priority actions. In this context, it is important to mobilize both national and regional structures in order to direct existing resources and create new resources and supports.

Another important objective is to diversify and support the livelihoods of the local people in order to reduce the use pressure on the steppes and to ensure sustainable use of the steppes. Accordingly, it is necessary to identify and support alternative sustainable livelihoods for the rural development in the steppe ecosystems, starting with priority steppe areas and their surroundings. Actions that will ensure coordination and cooperation with existing institutional structures and mechanisms that provide an important tool in this regard are defined.

In addition, it must be ensured that the women equally benefit from education and services in these studies, in line with their special needs, taking into account their roles in the family.

The indicators determined at the level of objectives are given below:

- i) *The number of studies aimed at increasing the added value of plant production and livestock practices and their benefits to the local people (units)*
- ii) *Change in household income of families benefiting from supported activities and best practices (percentage)*

Mainstreaming steppe conservation into productive landscapes

The strategy and action plan supports steppe conservation in both the protected areas and the productive landscapes. The mainstreaming options of steppe conservation into productive landscapes provided under the strategic goals are listed below:

- i) A governance model, and legislative and administrative regulations to support conservation and management of steppes in both protected areas and productive landscapes. (Strategic Goal 1)
- ii) Informed decision making towards landscape level steppe conservation supported through governance, coordination and monitoring mechanisms. (Strategic Goal 1)
- iii) Steppe conservation principles integrated into sectoral policies and programmes, strategy and planning documents. (Strategic Goal 1)
- iv) Knowledge, capacity and tools developed to integrate steppe conservation principles into both protected areas and productive landscapes. (Strategic Goal 1)
- v) Steppe conservation principals integrated into the afforestation works (Strategic Goal 2)
- vi) Particular steppe conservation proposals identified, implemented and monitored in both protected areas and productive landscapes (Strategic Goal 2)
- vii) Preliminary studies to integrate steppe conservation data into environmental layout and spatial plans (Strategic Goal 2)
- viii) Awareness raised and participation encouraged on sustainable use of natural resources of steppe ecosystems in productive landscapes (Strategic Goal 2)
- ix) Conservation and sustainable use of steppe ecosystems integrated into national and regional tourism plans and programmes (Strategic Goal 2)
- x) Agricultural production models and support mechanisms supported steppe biodiversity in both productive landscapes and protected areas including pilot support programmes to be implemented in collaboration by government institutions, incentives for implementation and dissemination of climate friendly and ecosystem based adaptation practices (Strategic Goal 3)
- xi) Sustainable and ecosystem based rangeland management integrated steppe biodiversity elements, implemented and monitored pilot and demonstration applications in collaboration. (Strategic Goal 3)
- xii) Steppe conservation integrated into rural development strategies, programmes and practices; support and incentive mechanisms developed for agriculture and livestock implementations as well as new income generating activities identified and supported to improve livelihood of local people depending on steppe ecosystems (Strategic Goal 4)
- xiii) Cooperation and coordination enhanced between key stakeholders across the productive landscapes and protected areas. (All strategic goals)

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPES							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
Objective 1.1. Development and Implementation of a governance model for the steppes							
<i>Objective Indicator: An effective governance mechanism</i>							
1.1.1	Establishing a structure that will ensure active participation in decision-making processes regarding the steppes and serve as an advisory board regarding the authorities and responsibilities of the institutions <i>(Establishing a "Sub-Committee for the Execution of the Contract on the National Basis" established under the National Biodiversity Coordination Board or a Commission if it deems necessary)</i>	2021-2023	<i>Sub-Committee/ Commission for the Implementation of the Convention on Biological Diversity on the National Basis</i>	MoAF (GDNCNP, GDPP, GDF, GDARP, GDAR, relevant service units), MoEU (GDPNA, GDSP, GDEM), Ministry of Culture and Tourism, Ministry of Industry and Technology (GDDA), Relevant Universities, Relevant NGOs, Private sector	Appointment of the National Biodiversity Coordination Board	0	1

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPES							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.1.2	Determination, implementation and monitoring of cooperation issues for the use of responsibilities and authorities of institutions and organizations for common purposes for the conservation and management of steppes	2021-2030	<i>Sub-Committee/ Commission for the Execution of the Contract on the National Basis</i>	MoAF (GDNCNP, GDPP, GDF, GDARP, GDAR, relevant service units), MoEU (GDPNA, GDSP, GDEM), Ministry of Culture and Tourism, Ministry of Industry and Technology (GDDA), Relevant Universities, Relevant NGOs, Private sector	Number of implemented joint activities	0	2

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.1.3	Ensuring the allocation of financial resources needed for the implementation of the National Steppe Conservation Strategy and Action Plan	2021-2026	<i>Sub-Committee/ Commission for the Execution of the Contract on the National Basis</i>	MoAF (GDNCNP, GDPP, GDF, GDARP, GDAR, relevant service units), MoEU (GDPNA, GDSP, GDEM), Ministry of Culture and Tourism, Ministry of Industry and Technology (GDDA), Relevant Universities, Relevant NGOs, Private sector	Number of decisions taken regarding budget expenditures	0	1

<p>1.1.4</p>	<p>Ensuring and monitoring the priorities of the National Steppe Conservation Strategy and Action Plan to be included in national and regional development plans, institutional and sectoral plans and programs (e.g., National Development Plans, Ministry Strategic Plans, Regional Development Administrations Strategy and Plans etc.)</p>	<p>2021-2026</p>	<p><i>Sub-Committee/ Commission for the Execution of the Contract on the National Basis</i></p>	<p>MoAF (Directorate of Strategy Development, GDNCNP, GDPP, GDPP, GDARP, GDAR, relevant service units), Ministry of Industry and Technology (GDDA), Ministry of Treasury and Finance, Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs, Private Sector</p>	<p>Number of plans and programs it is integrated into</p>	<p>0</p>	<p>5</p>
<p>1.1.5</p>	<p>Preparation of provincial steppe conservation strategy and action plans by using the Şanlıurfa</p>	<p>2021-2030</p>	<p><i>Sub-Committee/ Commission for the Execution of the</i></p>	<p>MoAF relevant service units, Relevant Local</p>	<p>Number of steppe conservation strategies and</p>	<p>1</p>	<p>6</p>

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPES							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
	Steppe Conservation Strategy and Action Plan as a base		<i>Contract on the National Basis</i>	Administrations, Relevant Universities, Relevant NGOs	action plans on provincial bases		
1.1.6	Monitoring and evaluation of the National Steppe Conservation Strategy and Action Plan, reporting and sharing it annually, making suggestions for the revision of the strategy according to the monitoring results, discussing the proposals with the relevant institutions and making a decision.	2021-2030	<i>Sub-Committee/ Commission for the Execution of the Contract on the National Basis</i>	MoAF relevant service units, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of reports	0	5
<p>Objective 1.2. Strengthening the legal and administrative structure for the conservation and effective management of the steppes <i>Objective Indicator: The number of legal and administrative regulations based on the effective management of the steppes (number)</i></p>							

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.2.1	Making necessary regulations to support the conservation of steppe biodiversity by analyzing the legislation and institutional structure related to biodiversity and protected areas	2021-2030	MoAF (GDNCNP, GDPP, GDF, GDARP)	Presidency of Strategy and Budget, MoEU (GDPNA, GDSP, GDEM), Ministry of Culture and Tourism, Relevant Universities, Relevant NGOs	Number of relevant legal regulations (regulation, notice, circular, etc.)	0	1
1.2.2	Establishing the legal basis for defining a new steppe-specific protected area status such as "Habitat and Species Conservation Area" in locations of priority species and areas and where it will support the conservation of steppe biodiversity at the national level	2021-2026	MoAF (GDNCNP)	Presidency of Strategy and Budget, MoAF All Service Units, MoEU (GDPNA)	Number of relevant legal regulations (regulation, notice, circular, etc.)	0	1

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPES							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.2.3	Making decisions to ensure that priority steppe area boundaries and conservation proposals are decisive in the decisions of Soil Preservation Boards in order to protect the steppe areas in the large plains against land transformation.	2021-2026	MoAF (GDAR)	Presidency of Strategy and Budget, MoAF General Directorate of Legal Services	Number of decisions taken for the conservation of steppe areas	0	5
1.2.4	Making the necessary arrangements regarding the failing aspects in the rangeland legislation, eliminating the incompatibilities between the legal regulations and practices (especially the structures of Rangeland Commissions and Management Unions, definition and implementation of penal sanctions)	2021-2026	MoAF (GDPP)	Presidency of Strategy and Budget, MoAF All Service Units, MoEU (GDPNA), Relevant NGOs	Number of relevant regulations	0	1

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPES							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.2.5	Making new regulations to make the legislation on grazing management planning applicable (preparation of legislation and implementation guides)	2021-2026	MoAF (GDPP, GDL)	Presidency of Strategy and Budget, MoAF General Directorate of Legal Services	Number of relevant regulations	0	1
<p>Objective 1.3. Developing research, monitoring and technology capacity for the conservation and effective management of the steppes <i>Objective Indicator: i) The change in the number of data and information production, sharing and use associated with steppes (percentage)</i></p>							
1.3.1	Completion of Turkey's vegetation studies and coding them with the National Habitat Classification and taking it into consideration in applications (also specifying the equivalents of the EUNIS classification system)	2021-2026	MoAF (GDNCNP)	MoEU (GDPNA), MoAF (GDF, GDAR, GDPP)	National Habitat Classification System	0	1

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPES							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.3.2	Improving the relevant monitoring interface in existing national databases (Noah's Ark) for monitoring the steppe biodiversity and ensuring its effective use	2021-2026	MoAF (GDNCNP)	MoAF (GDPP, GDAR, GDARP), MoEU, Relevant Universities, Relevant NGOs	Increase in data entry	0	10%
1.3.3	Ensuring that the data on steppe habitats and species are integrated into the existing data and monitoring systems of the institutions (TARBIS, MERBIS etc.)	2021-2026	MoAF (GDNCNP, GDPP, GDAR, GDARP)	MoAF Directorate of Strategy Development, Relevant Universities, Relevant NGOs	Number of data and monitoring systems it is integrated into	1	3
1.3.4	Researching traditional and new methods, techniques and practices that support the conservation of steppe biodiversity and sustainable use of its resources, and sharing the results	2021-2026	MoAF (GDARP, GDAR, GDNCNP)	Relevant Universities, Relevant NGOs	Number of studies and publications	20	100

GOAL 1. CREATING A COOPERATIVE ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF THE STEPPE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.3.5	Researching steppe ecosystems and human interaction and socio-ecological processes and sharing their results	2021-2026	MoAF (GDNCNP, GDARP)	Relevant Universities, Relevant NGOs	Number of studies and publications	5	15

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
Objective 2.1. Conservation of steppe ecosystems <i>Objective Indicator: i) Change in surface area of the steppe areas (percentage); ii) Change in surface area of the protected steppe areas (percentage); iii) Effective management of protected steppe areas (percentage)</i>							
2.1.1	Increasing the surface area of protected areas including priority steppe areas determined in line with the results of the National Biodiversity Inventory and Monitoring Project	2021-2030	MoAF (GDNCNP)	MoAF (GDPP), MoEU (GDPNA), Ministry of Culture and Tourism, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Proportion of protected steppe areas in total protected areas	4%	5%

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.1.2	Determining priority steppe areas for conservation on a national scale, bringing together different study results for this, evaluating and developing conservation suggestions (e.g., National Biodiversity Inventory and Monitoring Project results, SCP, PBA, N2000, KBA, IPA, IBA, etc.)	2021-2030	MoAF (GDNCNP)	MoAF (GDPP, GDARP), MoEU (GDPNA), Ministry of Culture and Tourism, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of recommended conservation priority areas	0	62
2.1.3	Identifying steppe ecosystems within the current protected areas system, highlighting biodiversity values, transferring them to plans and ensuring their effective management	2021-2030	MoAF (GDNCNP)	MoEU (GDPNA), Ministry of Culture and Tourism, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of plans with proposals for the conservation of steppe ecosystems	120	135

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.1.4	Identifying ecological corridors between priority steppe areas, determining effective conservation and sustainable use proposals in these areas, applying them and transferring them to regional plans (considering the gene flow between provinces)	2021-2030	MoAF (GDNCNP)	MoAF (GDF, GDPP), MoEU (GDPNA), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of ecological corridors	2	5
2.1.5	Continuing monitoring in special areas including steppe areas determined as a result of the National Biodiversity Inventory and Monitoring Project and taking actions according to the results of the monitoring	2021-2026	MoAF (GDNCNP)	MoAF (GDF, GDPP), MoEU (GDPNA), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of monitored areas	19	52

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.1.6	Establishing Long Term Steppe Monitoring Stations in different locations to represent the steppe areas in the country and performing monitoring works	2021-2030	MoAF (GDNCNP, GDARP, GDPP)	MoAF (GDF), MoEU (GDPNA), Ministry of Industry and Technology, TÜBİTAK, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of monitoring stations	0	2
2.1.7	Researching the functions and benefits of steppe ecosystems and transferring them to relevant plans	2021-2030	MoAF (GDPP, GDARP)	MoAF (GDNCNP, GDF, GDAR), TÜBİTAK Relevant Universities, Relevant NGOs	Number of plans considering steppe ecosystem services	1	4

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.1.8	Increasing the technical capacity of the personnel assigned in protected areas that contain steppe ecosystems for the conservation and monitoring of steppe species	2021-2026	MoAF (GDNCNP)	MoAF (GDF, GDPP, GDAR), Relevant Universities, Relevant NGOs	Number of training/year	2 /year	7 /year
2.1.9	Effectively controlling the activities that will damage the species characterizing the vegetation in priority steppe habitats in cooperation with the relevant institutions and other stakeholders.	2021-2030	MoAF (GDNCNP, GDPP, GDARP, GDF)	Ministry of Culture and Tourism, Ministry of Environment and Urbanization, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of activities controlled	0	10

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.1.10	Implementing and monitoring example practices for ecological restoration of destroyed steppe ecosystems	2021-2030	MoAF (GDNCNP, GDPP, GDF)	Ministry of Culture and Tourism, Ministry of Environment and Urbanization, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of exemplary applications	1	3
2.1.11	Integrating steppe biodiversity into afforestation practices in steppe ecosystems and afforestation in accordance with their natural habitats	2021-2026	MoAF (GDF)	MoAF (GDNCNP, GDCDE), Relevant Universities, Relevant NGOs	Increase in studies integrating steppe biodiversity	1%	2%

Objective 2.2. Conservation of the steppe species and their habitats

Objective Indicator: Number of effectively protected steppe species (number)

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.2.1	Implementing the conservation measures determined for priority steppe areas and priority steppe species in monitoring in cooperation with other stakeholders and making effective protection in these areas	2021-2026	MoAF (GDNCNP, GDPP, GDARP)	MoAF (GDAR), Ministry of Culture and Tourism, Ministry of Environment and Urbanization, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Change in population size of threatened species	0	10%
2.2.2	Creating and sharing the necessary baseline information for integrating the data of the national biodiversity inventory project for steppe ecosystems in accordance with the environmental layout and spatial plans	2021-2026	MoAF (GDNCNP)	Ministry of Environment and Urbanization (GDEM, GDSP), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of data sharing basemaps created	2	5

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.2.3	Preparing, implementing and monitoring species action plans, with priority for steppe-specific/specialized species, in cooperation with relevant institutions and other stakeholders	2021-2026	MoAF (GDNCNP, GDARP, GDPP)	MoAF (GDAR), Ministry of Culture and Tourism, Ministry of Environment and Urbanization, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of species action plans	5	15
2.2.4	Preparation of national red lists in priority species groups for effective conservation of steppe biodiversity and a review of species with a lack of information (IUCN "Data Deficient"; DD)	2021-2026	MoAF GDNCNP (IUCN National Committee)	IUCN National Committee member institutions, Relevant Universities, Relevant NGOs	Number of taxa that are included in the National Red List	0	1

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.2.5	Reintroduction studies of priority steppe species to places where they are previously distributed, carrying out studies to include new species and their monitoring	2021-2026	MoAF (GDNCNP, GDARP)	MoAF (GDAE), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of species reintroduced	1	3
2.2.6	Supporting detailed ecological research on steppe ecosystems (e.g., on population dynamics, herbivorous species-vegetation dynamics, interaction between species, etc.) and developing and supporting projects based on the subject	2021-2026	MoAF (GDNCNP, GDPP)	MoAF (GDARP), MoEU (GDPNA), TÜBİTAK, Relevant Universities, Relevant NGOs	Number of cooperation correspondences with Universities, NGOs, Research Institutes etc.	0	3

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.2.7	Providing R&D support to determine the effects of invasive alien species on the steppe ecosystem and steppe species and to prevent adverse effects	2021-2030	MoAF (GDARP), TÜBİTAK	MoAF (GDNCNP), Ministry of Industry and Technology, Relevant Universities, Research Institutes, Relevant NGOs	Number of projects supported	0	1
2.2.8	Identifying the roads and water channels where wild animals cross intensively in the steppe areas and placing warning signs on the passages and establishing "ecological bridges"	2021-2030	MoAF (GDNCNP)	MoAF (SHW), GD of Highways, Turkish State Railways, Relevant Universities, Relevant NGOs, District Governorships	Number of ecological bridges	0	2

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.2.9	Increasing the inspections and technical capacity in order to combat poaching effectively, working in cooperation with the local people in this context	2021-2026	MoAF (GDNCNP)	MoAF (Dept. of Training and Publication), Ministry of National Education, Presidency of Religious Affairs, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of official reports/year	0 /year	50 /year

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.2.10	Increasing the inspections in order to activate the combat against bio-smuggling, working in cooperation with the local people in areas where these species are found	2021-2030	MoAF (GDNCNP, GDARP)	MoAF (Dept. of Training and Publication, GDARP), Provincial Directorates of Agriculture and Forestry, Ministry of National Education, Presidency of Religious Affairs, Relevant Local Administrations Law Enforcement, Relevant Universities, Relevant NGOs	Number of bio-smuggling cases	0	5

Objective 2.3. Conservation of the genetic resources of steppes

Objective Indicator: The number of steppe species that are effectively protected for genetic resources (number)

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.3.1	Identifying plant and animal species that may be important in terms of genetic resource in the steppes, determining and recording their genetic resources	2021-2030	MoAF (GDARP, GDNCNP)	MoAF (GDPP), TÜBİTAK, Relevant Universities, Research Institutes, Relevant NGOs	Number of research and projects	3	13
2.3.2	Increasing the national support program for scientific and R&D studies for the conservation of genetic resources of ancestral species	2021-2026	MoAF (GDARP), TÜBİTAK	Ministry of Industry and Technology, Relevant Universities, Research Institutes, Relevant NGOs	Increase in the number of scientific studies	0	5%

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.3.3	Ex-situ reproduction of rare, narrow-range priority steppe plant species according to the threats on the population and habitat, and transferring these species to nature, ensuring ex-situ conservation in gene banks and botanical gardens	2021-2030	MoAF (GDARP, GDPP, GDNCNP)	MoAF (GDNCNP), Relevant Local Administrations, TÜBİTAK, Relevant Universities, Research Institutes	Number of ex-situ protected species	70	170
2.3.4	Increasing the number of botanical gardens and representation ratio of the steppe biodiversity	2021-2026	MoAF (GDARP)	MoAF (GDNCNP), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of botanical gardens	3	4

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.3.5	Compilation, recording and protection of traditional information related to genetic resources	2021-2030	MoAF (GDARP, GDNCNP)	MoAF (GDPP, GDF), Relevant Local Administrations, TÜBİTAK, Relevant Universities, Research Institutes Relevant NGOs	Number of research/studies	9	33
2.3.6	Reporting and publishing innovations and practices related to traditional knowledge	2021-2030	MoAF (GDARP, GDNCNP)	MoAF (GDPP, GDF), Relevant Local Administrations, Relevant Universities, Research Institutes Relevant NGOs	Number of posts shared	19	69

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.3.7	Determining important management and production systems in terms of biodiversity, local knowledge, cultural heritage associated with steppe biodiversity as part of Globally Important Agricultural Heritage Systems (GIAHS) and pursuing the necessary application, labeling, and certification processes	2021-2030	MoAF (GDARP)	FAO, Universities, Research Institutes, Relevant NGOs	Number of sites certified	0	1

Objective 2.4. Increasing the adaptive capacity of the steppes to climate change
Objective Indicator: The number of applications regarding adaptation to climate change (number)

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.4.1	Modeling and evaluation studies for determining the effects of climate change on steppe ecosystems and the ecosystem services they provide, and preparation and supporting the implementation of a monitoring action plan	2021-2030	MoAF (GDARP, GDNCNP)	MoAF (GDAR, GDPP, GDCDE, Turkish State Meteorological Service), MoEU (GDEM), TÜBİTAK, Relevant Universities, Research Institutes, Relevant NGOs	Number of modeling and evaluation studies	0	1

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.4.2	Establishing long-term monitoring stations for ecological and meteorological monitoring in priority steppe areas to be selected	2021-2030	MoAF (GDNCNP, GDPP)	MoAF (Turkish State Meteorological Service, GDARP), MoEU (GDEM), TÜBİTAK, Relevant Universities, Research Institutes, Relevant NGOs	Number of monitoring stations	0	2
2.4.3	Developing adaptation proposals in coordination with existing studies for the species, areas and ecosystem services that will be most affected by climate change and making example applications in cooperation	2021-2030	MoAF (GDNCNP, GDARP, GDPP, GDAR)	MoAF (GDCDE), MoEU (GDEM), Relevant Universities, Research Institutes, Relevant NGOs	Number of exemplary applications	0	3

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.4.4	Preparation and implementation of climate change adaptation plans in coordination with existing studies in existing protected areas (e.g., assisted migration, corridor creation, gene transfer between populations)	2021-2030	MoAF (GDNCNP)	MoEU (GDEM), Relevant Universities, Research Institutes, Relevant NGOs	Number of climate change adaptation plans	0	3
2.4.5	Determining training needs in order to increase the capacity of adaptation to climate change in steppe ecosystems and developing and implementing training programs in cooperation with relevant institutions	2021-2026	MoAF	MoAF (GDNCNP, GDPP, Dept. of Training and Publication, GDAR, GDARP, GDCDE, Meteorological Service), MoEU (GDEM), Relevant Universities, Research Institutes, Relevant NGOs	Number of training activities	0	1

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.4.6	Identifying and disseminating national and international good practice examples regarding adaptation to climate change in steppe ecosystems	2021-2030	MoAF (GDCDE)	MoAF (GDNCNP, GDPP, Dept. of Training and Publication, GDAR, GDARP), Relevant Universities, Research Institutes, Relevant NGOs	Number of good practice examples	2	4
<p>Objective 2.5. Introducing the biodiversity value of the steppes and increasing its visibility</p> <p><i>Objective Indicator: Number of persons reached regarding the promotion and visibility of steppes (Number of persons)</i></p>							
2.5.1	Sharing the results of research on steppe biodiversity	2021-2026	MoAF (GDNCNP, GDARP, GDPP)	MoAF (Dept. of Training and Publication), Relevant Universities, Research Institutes, Relevant NGOs	Number of posts shared	33	83

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.5.2	Establishment of promotional and nature education centers in priority areas that will promote the steppe ecosystems and species and raise awareness on the biodiversity value of the steppes	2021-2030	MoAF (GDNCNP, GDPP, GDARP)	Ministry of National Education, Ministry of Culture and Tourism, Relevant Local Administrations, Relevant NGOs	Number of publicity and nature education centers	7	10

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.5.3	Diversifying nature tourism and ecotourism practices for the promotion of steppes and their biodiversity (observing plant, bird, butterfly, small mammal large mammal species and including tour routes for these species)	2021-2026	MoAF (GDNCNP, GDARP)	Ministry of Culture and Tourism, Relevant Local Administrations, Regional Development Administrations, Development Agencies, Relevant Universities, Relevant NGOs, TÜRSAB Association of Turkish Travel Agencies	Number of routes dedicated to the steppe	1	2

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.5.4	Regularly carrying out awareness and training activities for different interest groups (children, youth, women, opinion leaders, farmers, shepherds, imams, disabled individuals, etc.) in cooperation with relevant institutions and other stakeholders on the value and biodiversity of the steppes	2021-2030	MoAF (Dept. of Training and Publication, GDNCNP, GDPP)	MoAF (GDAR, GDF, GDL, GDARP), Ministry of National Education, Presidency of Religious Affairs, Relevant Local Administrations, Regional Development Administrations, Development Agencies, Relevant Universities, Relevant NGOs	Number of training activities	10	25

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.5.5	Preparing materials regarding the issues related to the conservation of steppe ecosystems and biodiversity values for formal and non-formal education programs	2021-2026	MoAF (Dept. of Training and Publication, GDNCNP, GDPP, GDARP)	Ministry of National Education, Relevant Universities, Relevant NGOs	Number of training materials prepared related to the steppes	0	10
2.5.6	Disseminating the steppe training sets developed as part of "Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project" for the teachers and students at the schools in and around the protected areas, at the national level	2021-2030	MoAF (Dept. of Training and Publication, GDNCNP)	Ministry of National Education, Relevant Universities, Relevant NGOs, FAO	Number of areas it is disseminated to	0	33

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at the levels of ecosystem, species, genetic and ecological process diversity)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.5.7	Preparation of guides on steppe plants collected and used extensively by the local people and carrying out educational activities	2021-2026	MoAF (GDNCNP, GDARP)	Ministry of National Education, Presidency of Religious Affairs, Relevant Universities, Relevant NGOs	Number of guides/training	10	11
2.5.8	Preparing content for the effective promotion of conservation priority steppe species on different platforms and using them effectively in public spots, documentaries and social media	2021-2026	MoAF (Dept. of Training and Publication, GDNCNP, GDPP, GDARP)	Ministry of National Education, Presidency of Religious Affairs, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of content developed	5	12

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
Objective 3.1. Disseminating agricultural practices supporting the steppe biodiversity							
<i>Objective Indicator: Change in agricultural practices that support biodiversity (number of farmers or area of land)</i>							
3.1.1	Establishing an example support program for environmentally-friendly agricultural practices in steppe areas (such as ÇATAK Program)	2021-2026	MoAF	MoAF (GDPP, GDARP, GDAR, GDNCNP), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of environmentally-friendly applications within the scope of the support	1	4
3.1.2	Carrying out the necessary studies for the implementation of the agriculture and environmental measure program, which has already been developed as a model, and to disseminate it at the national level (e.g., IPARD Agriculture-Environment Measure Biodiversity Sub-Measure Polatlı Great Bustard example)	2021-2026 (in GDAE) 2021-2030 (areas out of GDAE)	MoAF (GDAR, GDNCNP, GDAE)	MoAF (GDPP), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of applications	0	2

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.1.3	Establishing and implementing agricultural implementation incentives that support steppe biodiversity in protected areas that contain steppe areas	2021-2026	MoAF (GDNCNP, GDPP, GDAR)	Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs, Chamber of Agricultural Engineers, Chambers of Agriculture	Number of cooperation protocols for incentives	0	1
3.1.4	Increasing the support for organic and good agriculture and cooperating with leading farmers on this	2021-2026	MoAF (GDPP)	MoAF (GDAR), ARDSI, The Ministry of Finance, Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Increase in the amount of application area	0	10%

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.1.5	Ensuring the continuity of legumes and forage crops by adding them to alternation under alternate agriculture support conditions	2021-2026	MoAF (GDPP)	MoAF (GDARP), Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Alternating area supported annually	1 million decares	5 million decares
3.1.6	Establishment of technical infrastructure for supporting and disseminating no-till agriculture and direct cultivation of stubble in areas owned by local people	2021-2026	MoAF (GDPP, GDAR)	MoAF (GDNCNP), Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of scientific studies technical reports to support the implementation of the relevant applications	0	1

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.1.7	Reducing insecticide use and increasing incentives and projects to support the conservation of biodiversity in agriculture	2021-2030	MoAF (GDFC, GDARP)	MoAF (GDAR, GDPP), Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of biological control application projects	3	8
3.1.8	Establishing and implementing incentive programs that support the reduction of insecticide and herbicide use by using integrated pest control methods in agricultural lands around priority steppe areas	2021-2026	MoAF (GDPP, GDFC)	MoAF (GDNCNP, GDAR, ARDSI), Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of incentive programs	1	3

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.1.9	Promoting the production and use of organic and organomineral fertilizers in priority steppe areas, reducing the import of chemical fertilizers and environmental pollution, and expanding biological and biotechnical control	2021-2026	MoAF (GDPP)	MoAF (GDFC, GDARP, GDAR), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Increase in the area of biological and biotechnical control	1%	2%
3.1.10	Increasing support for modern irrigation techniques	2021-2030	MoAF (ARDSI, SHW)	MoAF (GDARP, GDAR), Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Increase in the amount of application area	0	5%

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.1.11	Evaluating the agricultural water need in order to make irrigation projects that will adversely affect the steppe ecosystems in terms of conserving resources, and directing irrigation projects according to these evaluation results	2021-2026	MoAF (SHW)	Regional Development Administrations, Development Agencies, Relevant Local Administrations, Irrigation Associations, Universities	Number of irrigation projects considered in the assessment	3	5
3.1.12	Preparation of technical study report regarding leaving small natural areas/habitats between fields while consolidating and excluding rangelands from consolidation	2021-2030	MoAF (SHW, GDPP)	MoAF (GDAR, GDNCNP), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of technical study reports	0	1

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.1.13	Supporting alternative practices to reduce stubble burning practices and expanding them throughout the country (e.g., use of milling cutters, direct planting, increasing penalties, awareness-raising activities etc.)	2021-2026	MoAF (ARDSI, GDAR, GDPP)	Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs, Chamber of Agricultural Engineers	Number of relevant practices	2	7
3.1.14	Informing and raising awareness for technical personnel and producers on agricultural practices that support biodiversity	2021-2026	MoAF (Dept. of Training and Publication, GDPP, GDAR)	MoAF (GDNCNP), Relevant Universities, Chambers of Agriculture, Universities	Mevcut eğitim programları içinde biyolojik çeşitliliği dikkate alan eğitim programlarının oranı	1%	5%
<p>Objective 3.2. Ensuring sustainable and ecosystem-based rangeland management</p> <p><i>Objective Indicator: Change in surface area under sustainable and ecosystem-based rangeland management (percentage)</i></p>							

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.2.1	Ensuring the active participation of units working on biodiversity within the Ministry of Agriculture and Forestry in the stages of rangeland management	2021-2026	MoAF (GDNCNP, GDPP)	Provincial Rangeland Commissions, Relevant Universities, Relevant NGOs	Number of meetings and decisions actively attended	3	8
3.2.2	Using the results of the National Biodiversity Inventory and Monitoring Project and priority species/area information and conducting additional research in order to make a biodiversity inventory of rangelands	2021-2026	MoAF (GDNCNP, GDPP)	Provincial Rangeland Commissions, Relevant Universities, Relevant NGOs	Number of National biodiversity inventories	1	2
3.2.3	Integration, implementation and monitoring of biodiversity data in grazing planning and management	2021-2026	MoAF (GDNCNP, GDPP)	Provincial Rangeland Commissions, Relevant Universities, Relevant NGOs	Number of grazing planning and management works that include biodiversity elements	1	4

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.2.3.1	Administrative decision making on the use of local seeds and plants in improvement studies for sustainable rangeland management and its implementation in projects	2021-2026	MoAF (GDPP, GDARP)	Relevant Universities, Relevant NGOs	Number of decisions made	0	1
3.2.3.2	Making and supporting exemplary practices for holistic grazing management for sustainable and restorative rangeland management	2021-2030	MoAF (GDPP)	MoAF (GDL), Provincial Rangeland Commissions, Relevant Universities, Relevant NGOs, FAO	Number of exemplary practices	3	6
3.2.3.3	Performing seed R&D and production studies in meadow and rangeland improvement studies for sustainable rangeland management	2021-2026	MoAF (GDARP, GDAE)	Relevant Universities, Relevant NGOs	Increase in the number of R&D and production studies	0	5%
3.2.3.4	Increasing and spreading support for growing fodder crops, especially to be used in the winter months for sustainable rangeland management	2021-2030	MoAF (GDPP)	MoAF (GDARP), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Increase in current support rate	1%	5%

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.2.3.5	Conducting and encouraging case studies for the use of organic compost fertilizers and soil microbiology enrichment preparations for sustainable and restorative rangeland management	2021-2026	MoAF (GDPP)	Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of exemplary practices	0	2
3.2.4	Disseminating the example sustainable grazing plan preparation experience acquired from the "Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project"	2021-2026	MoAF (GDPP, GDL)	MoAF (GDF, GDNCNP), Provincial Rangeland Commissions, Relevant Local Administrations, Relevant Universities, Relevant NGOs, FAO	Number of Provincial Grazing Plans	1	4

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.2.5	Making protocols with universities and/or the private sector for more effective monitoring of rangeland improvement practices (on topics, such as biodiversity, biomass, amount of soil organic matter, the success of the breeding study, the number and breeds of grazing animals, etc.)	2021-2030	MoAF (GDPP)	MoAF (GDF, GDARP, GDL), Provincial Rangeland Commissions, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of monitoring studies created in priority areas	0	3
3.2.6	Developing the infrastructure to use remote sensing and grazing planning application tracking systems for more effective monitoring of rangeland improvement practices	2021-2026	MoAF (GDPP)	MoAF (GDF, GDL), MoEU (General Directorate of Land Registry and Cadastre), Provincial Rangeland Commissions, Relevant Local Administrations, Relevant Universities, Relevant NGOs	The number of remote sensing and application tracking systems developed	0	1
3.2.7	Preparation of annual rangeland status reports on a provincial basis	2021-2030	MoAF (GDPP)	Provincial Rangeland Commissions, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of studies conducted throughout the country	0	3

GOAL 3. IMPROVING THE USE OF RESOURCES IN THE STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.2.8	Completion of rangeland determination, delimitation and allocation studies	2021-2026	MoAF (GDPP)	MoAF (GDF, GDARP, GDL), MoEU (General Directorate of Land Registry, General Directorate of National Real Estate), Provincial Rangeland Commissions	Amount of land where rangeland detection and delimitation studies are completed	9 million hectares	14.6 million hectares
3.2.9	Including grazing planning in training for rangeland users and their families, herd management personnel and planning and realization of these taking into account the importance of the steppes and the sustainable use of their resources	2021-2023	MoAF (Dept. of Training and Publication, GDPP, GDL)	MoAF (GDNCNP), Provincial Rangeland Commissions, Relevant Local Administrations, Relevant Universities, Relevant NGOs	The proportion of training programs focused on rangeland use among the existing training programs	1%	5%
3.2.10	Determining the social, economic and ecological infrastructure and making necessary regulations to support the traditional livestock activities of the nomads	2021-2023	MoAF (GDPP, GDL)	Provincial Rangeland Commissions, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of regulations	0	3

GOAL 4. IMPROVING THE LIVELIHOODS OF THE LOCAL PEOPLE WHO BENEFIT FROM THE STEPPES							
No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
Objective 4.1. Establishing the essential environment that can increase the added value of plant production and animal husbandry practices in the steppe and related areas <i>Objective Indicator: The number of studies aimed at increasing the added value of plant production and livestock practices and their benefits to the local people (units)</i>							
4.1.1	Conducting socio-economic research on human steppe interaction in priority steppe areas and conducting fragility and impact analysis for the people benefiting from the steppe	2021-2026	MoAF (GDNCNP, GDARP, GDPP)	MoAF (GDF), Regional Development Administrations, Relevant Universities, Relevant NGOs	Number of relevant research	1	4
4.1.2	Performing the value chain analysis of the products produced using the steppes	2021-2023	MoAF (GDARP, GDPP, GDL)	Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of studies	0	3

GOAL 4. IMPROVING THE LIVELIHOODS OF THE LOCAL PEOPLE WHO BENEFIT FROM THE STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
4.1.3	Carrying out informative and geographical marking studies for the protection of biodiversity-friendly production and lifestyles, ecological and cultural values associated with the steppe	2021-2026	MoAF (GDARP, GDPP, GDNCNP, GDAR)	MoAF Directorate of Strategy Development, Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of products with geographical indication	100	220

GOAL 4. BOZKIRLARDAN IMPROVING THE LIVELIHOODS OF THE LOCAL PEOPLE WHO BENEFIT FROM THE STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
<p>Objective 4.2. Diversifying and supporting the income-generating activities for local people based on sustainable utilization of steppes <i>Objective Indicator: Change in household income of families benefiting from supported activities and best practices (percentage)</i></p>							

GOAL 4. BOZKIRLARDAN IMPROVING THE LIVELIHOODS OF THE LOCAL PEOPLE WHO BENEFIT FROM THE STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
4.2.1	Evaluation of rural development opportunities in steppe areas where species with economic value are concentrated	2021-2026	MoAF (GDNCNP, GDPP, GDAR)	MoAF (GDARP, GDF, GDL, ARDSI), Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of related studies	0	5
4.2.2	Carrying out activities for the production, marketing and branding of traditional handicrafts and local products in cooperation with relevant institutions and other stakeholders and supporting practices in order to diversify the income based on rural tourism and ecotourism in steppe areas and their surroundings	2021-2026	MoAF (GDNCNP, GDARP)	Ministry of Culture and Tourism, Ministry of National Education, MoAF (GDPP, GDAR), Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of exemplary practices	0	5

GOAL 4. BOZKIRLARDAN IMPROVING THE LIVELIHOODS OF THE LOCAL PEOPLE WHO BENEFIT FROM THE STEPPE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
4.2.3	Supporting the realization and dissemination of silvopastoral and agrosilvopastoral example projects where plant production and animal husbandry practices will be implemented efficiently together	2021-2026	MoAF (GDPP, GDAR, GDL)	MoAF (GDNCNP, GDARP ARDSI, GDF), Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs, FAO	Number of exemplary practices	0	1
4.2.4	Recording and cultivating steppe species with Medicinal and Aromatic Plant characteristics and supporting their production	2021-2026	MoAF (GDARP, GDPP, GDNCNP, GDAR, GDF)	Regional Development Administrations, Development Agencies, Relevant Local Administrations, Relevant Universities, Relevant NGOs, FAO	The number of steppe plants registered and produced as Medicinal Aromatic Plants	10	25

6. The Governance Model

The United Nations Convention on Biological Diversity, which aims at the conservation of biodiversity, sustainable use of biological resources, and the fair and equitable sharing of the benefits arising from the utilization of genetic resources, appropriately, was signed by Turkey in 1992, and it has been ratified by Law numbered 4177, dated 29.08.1996 (The Law Regarding Approval of the Convention on Biological Diversity). The contract entered into force in Turkey on May 14, 1997.

In accordance with Article 6 of the UN Convention on Biological Diversity, the contracting countries are obliged to prepare or update the National Biodiversity Strategy and Action Plan (NBSAP). NBSAP determines the boundaries of the international commitments of the Parties (states) under the Convention in terms of reflecting the country priorities in the implementation of the decisions taken within the scope of the Convention on Biological Diversity.

National Biodiversity Strategy and Action Plan (NBSAP) was prepared in 2001 and later updated in 2007 for the period 2007-2017, in order to fulfill our obligations under the Convention, to implement applications compatible with the regulations within the European Union's nature conservation sector and to achieve conservation and sustainable use targets by addressing the biodiversity of Turkey with a comprehensive and holistic approach. National Biodiversity Action Plan (NBAP) covering the period 2018-2028 was prepared by determining new national targets and actions that are complementary to NBSAP and compatible with Aichi targets.

The 16th Conference of the Parties to the Convention on Biological Diversity will be hosted by Turkey in 2022. The National Biodiversity Coordination Board has been established under the Presidency Circular No 2019/15, under the presidency of the Minister of Agriculture and Forestry, in order to follow the developments in the global biodiversity agenda, to bring biodiversity to the economy in a sustainable way, and to effectively execute the Convention and the term presidency.

After the National Steppe Conservation Strategy and Action Plan is approved, it will need a coordination mechanism for its effective implementation, monitoring and supervision. In the workshops and meetings held in the preparatory process, it has been proposed that the main coordination of the National Steppe Conservation Strategy and Action Plan is to be undertaken by the National Biodiversity Coordination Board established by the Presidential Circular

numbered 2019/15, in accordance with the experiences from governance mechanisms implemented in Turkey (Appendix 5).

According to the circular, the Board will be established with the participation of senior officials, who have authority on behalf of their respective units, from the Presidency of Strategy and Budget, Presidency of Science, Technology and Innovation Policies Board, Ministry of Agriculture and Forestry, Ministry of Environment and Urbanization, Ministry of Foreign Affairs, Ministry of Energy and Natural Resources, Ministry of Interior, Ministry of Culture and Tourism, Ministry of National Education, Ministry of Health, Industry and Technology, Ministry of Commerce, Ministry of Transportation and Infrastructure Ministry, Turkey Scientific and Technological Research Council of Turkey Chambers and Stock Exchanges Union, Foreign Economic Relations Board and the Union of Chambers of Turkish Engineers and Architects Chamber of Forest Engineers. Legislative preparation regarding the working procedures and principles of the Board continues.

The Coordination Board, which will convene at least once a year, the working procedures and principles of which will be determined by the Board, and the secretariat services and coordination of which will be carried out by the Ministry of Agriculture and Forestry, facilitates coordination in the following issues;

- Following the global biodiversity agenda,
- Ensuring that the benefits arising from the sustainable use of biodiversity are brought to the economy,
- Effectively executing the Convention on Biological Diversity and the term presidency,
- Determining the Institutions that will chair the sub-committees.

The sub-committees of the Board are:

1. International Biodiversity Policies and Projects Sub-Committee
2. Sub-Committee for the Execution of the Contract on the National Basis
3. Sub-Committee on the Management of Biodiversity
4. Sub-Committee of Sustainable Management of Biodiversity and Inclusion in Economy
5. Technology, Research, Development and Education Sub-Committee
6. Legal Sub-Committee

The “Sub-Committee for the Execution of the Contract on the National Basis”, which will be established under the Board and whose duties include the implementation of the National Biodiversity Strategy and Action Plan, will be the main board responsible for this coordination. Permanent members of the sub-committee, which will meet at least twice a year, are the representatives from:

- Presidency Strategy and Budget Directorate
- Ministry of Agriculture and Forestry
- Environment and urban ministry,
- Ministry of Justice
- Ministry of Foreign Affairs
- Energy and Natural Resources Ministry
- Culture and Tourism Ministry
- Ministry of Health
- Ministry of Transport and Infrastructure
- Ministry of Education
- Ministry of Industry and Technology
- Ministry of Interior
- Turkey's Scientific and Technological Research Institution

Other institutions and organizations that are not permanent members of the agenda may also be invited to the meetings.

The duties and powers of the Sub-Committee for the Execution of the Contract on the National Basis are as follows:

1. To coordinate the determination of national biodiversity policies.
2. To ensure the coordination regarding the implementation and, when necessary, updating of the National Biodiversity Strategy and Action Plan and its annexed National Biodiversity Action Plan in order to ensure the execution of the contract.
3. To make gap analysis regarding the execution of the contract, to provide coordination for determining solution proposals.
4. To provide coordination regarding the periodic performance of biodiversity inventory and monitoring studies.
5. Ensuring coordination regarding determination and development of indicators related to biodiversity, ensuring compliance with international indicator sets and monitoring.
6. Ensuring coordination in combating bio-smuggling and recording traditional knowledge.
7. Ensuring coordination regarding the determination of sub-focal points and national competent authorities where the contract needs to be executed.
8. To coordinate the establishment of the contract clearing house mechanism.
9. To provide coordination regarding Access and Benefit Sharing.
10. Coordinating promotion and awareness activities on biodiversity.
11. Coordinating aspects of the proper integration of all databases on biodiversity.

12. Performing other duties assigned by the Board.

If deemed necessary, a Commission can be established by the Sub-Committee to ensure effective participation in decision-making processes regarding the steppes and to act as an advisory board regarding the authorities and responsibilities of the institutions. It is important that this commission takes an active role in the implementation, monitoring, and evaluation of the strategy and action plan. For the implementation of the governance mechanism, it is important to develop cooperation and ensure effective communication between relevant institutions and stakeholders. Making the necessary arrangements for the gaps in the current legal and administrative structure and establishing new legal structures and regulations are priority issues.

Secretariat Service: Secretariat service of the National Biodiversity Coordination Board is conducted by the General Directorate of Nature Conservation and National Parks. On the implementation of the National Steppe Conservation Strategy and Action Plan, the relevant General Directorates will provide technical support to the secretariat.

Reporting: In order to strengthen the coordination and cooperation between the governmental organizations and stakeholders for the effective implementation, monitoring and assessment of the National Steppe Conservation Strategy and Action Plan, the necessary information about the process will be obtained with the official correspondences at the end of each year and will be submitted as a report to the Sub-Committee for the Execution of the Contract on the National Basis.

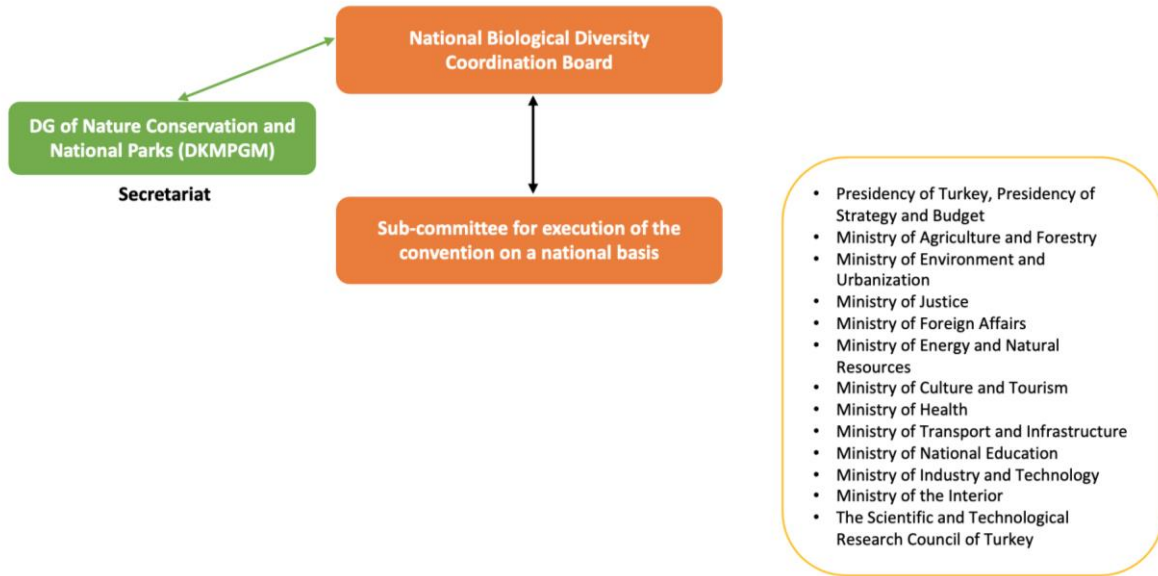


Figure 37. Proposed structure for the coordination of the National Steppe Conservation Strategy and Action Plan

7. The Monitoring System

Effective monitoring, evaluation and reporting of the National Steppe Conservation Strategy and Action Plan implementations will be made to the Sub-Committee for the Execution of the Contract on the National Basis. Since the secretariat service of the National Biodiversity Coordination Board, to which the Board is affiliated, is conducted by the General Directorate of Nature Conservation and National Parks, therefore the main reporting of the monitoring system will also be made by this institution.

The monitoring system will be one of the most important management tools for the National Steppe Conservation Strategy and Action Plan. This system has been defined as a systematic process to track changes in line with the goals and objectives of the National Steppe Conservation Strategy and Action Plan.

Monitoring and evaluation of the National Steppe Conservation Strategy and Action Plan, continuation of monitoring studies conducted by various institutions and organizations in Turkey will support the enhancement of interorganizational collaborations and the development of solutions for the implementation problems by the Sub-Committee for the Execution of the Contract on the National Basis.

It is recommended that monitoring studies be carried out on the following issues in line with the goals and objectives of the National Steppe Conservation Strategy and Action Plan:

1. Monitoring the progress in the implementation of the National Steppe Conservation Strategy and Action Plan,
2. Continuing the monitoring studies of species on the priority steppe areas and monitoring the change in the condition of the species and their habitats,
3. Monitoring the change in the condition of the rangelands,
4. Monitoring the change in the severity of threats to the priority steppe areas and species,
5. Monitoring the effects of climate change on the steppe ecosystems,
6. Monitoring the success of conservation and sustainable management practices (monitoring the effects of conservation activities, habitat restoration studies, the management effectiveness of the protected areas, the success of rangeland management practices, the transformation of agricultural fields, the success of eco-friendly/nature-friendly/climate-smart/organic/holistic agricultural practices, etc.).

The current status and results of the monitoring studies will be presented at the meeting of the Sub-Committee for the Execution of the Contract on the National Basis once a year.

If necessary, requesting change proposals for the National Steppe Conservation Strategy and Action Plan according to the monitoring results and discussing and resolving these with the relevant institutions will increase the effectiveness of the practices.

One of the most important outputs of the monitoring system is the annual reporting of the activities of the National Steppe Conservation Strategy and Action Plan Coordination Board and sharing it with the relevant institutions. With this reporting, the progress, successes and problems in applications and the lessons taken will be regularly recorded.

Monitoring and Assessment Plan Proposal:

Monitoring Subject	Assessment	Method	Responsible Institution	Reporting Period
Monitoring the progress of the applications of the National Steppe Conservation Strategy and Action Plan	Progress Report of the National Steppe Conservation Strategy and Action Plan	Interviews and evaluations made by the group of independent experts	General Directorate of Nature Conservation and National Parks (Secretariat)	Annual
Monitoring priority steppe habitats, species, threats to them, and conservation efforts for them	Monitoring Report for Priority Steppe Habitats and Species	Field works	General Directorate of Nature Conservation and National Parks	Every 2 years
Monitoring the management effectiveness of the steppe protected areas	National Protected Areas Management Effectiveness Assessment Report	METT assessment by GDNCNP	General Directorate of Nature Conservation and National Parks	Every 3 years

Monitoring Subject	Assessment	Method	Responsible Institution	Reporting Period
Monitoring the status and management practices of rangelands across the country	National Rangeland Status Report	Satellite image analysis and land works	General Directorate of Plant Production	Every 2 years
Monitoring the change of agricultural fields and model implementations in agriculture-livestock throughout the country	National Agriculture and Livestock Status Report	Farmers register system, satellite image analysis and land works	General Directorate of Plant Production	Every 3 years
Monitoring the effects of climate change on the steppe ecosystems	Report on the effects of climate change on the steppe ecosystems	Modelling, land works	GDARP	Every 5 years

All reports to be prepared as a result of the monitoring studies will be evaluated in the meetings of the Sub-Committee for the Execution of the Contract on the National Basis and the decisions to be taken for an effective management will be implemented by the relevant institutions.

8. Steppe Terminology

- 1. Alien Species:** A species intentionally or unintentionally carried by humans to a place, area, or region where it does not naturally occur.
- 2. Anatolian Steppes:** They are mostly anthropogenic steppes where xerophytic herbaceous plants are dominant in Central Anatolia, Eastern Anatolia and Southeastern Anatolia Regions with low rainfall, arid and semi-arid climate.
- 3. Anthropogenic Steppe:** Steppes that are formed by the destruction of forest cover as a result of human activities such as overgrazing, clearing for agriculture, fuel supply, etc.
- 4. Climate Change:** In addition to natural climate changes observed over comparable time periods, changes in the climate as a result of human activities that directly or indirectly disrupt the composition of the global atmosphere.
- 5. Climate Variability:** It is the variation of a climate variable from its long-term average value in a region.
- 6. Climax:** The steady-state reached by a community as the final phase of succession.
- 7. Desertification:** It is the "Land Degradation" that occurs as a result of various factors including climate changes and human activities in arid and semi-arid areas.
Characteristic species of the vegetation decrease or disappear, overall vegetation cover decreases significantly, the amount of bare soil increases, grass length becomes shorter, and dwarf shrubs, also seen in semi-deserts, become dominant.
- 8. Drought:** The event in which the biomass productivity of the land is negatively affected because of insufficient absorption of atmospheric moisture (rain, snow, dew, etc.) that reaches the ground by the soil and excessive evaporation, resulting from improper land management and/or significant hydrological imbalances when the rainfall is below average for years and/or is irregular.
- 9. Ecosystem:** It is a dynamic system in which plant, animal and microorganism communities and their non-living environments interact as a functional unit.
- 10. Erosion:** The process in which the soil clusters (aggregates) are disintegrated and transported by factors such as water, wind and gravity; consequently, accumulating in environments different from where they were once located.
- 11. Forage Plants:** They are plants that are cultivated as animal feed or that grow naturally, and also generally have the characteristics of conserving soil and water, increasing the yield of the products that come after them in the crop rotation. They are harvested and dried or silaged to be fed directly or later.
- 12. Forest-Steppe:** These are forest areas located in ecological regions dominated by steppes.
The difference from the wooded steppe is that these areas are mostly in the transition regions from forest to steppe.

13. Governance: Basically, it is the processes and structures that enable society to share power and transform it into individual and social activities. Refers to participatory decision-making and management processes based on cooperation, where different actors apart from governmental institutions take responsibility.

14. Grass (Poaceae - Gramineae) Steppes: The steppes dominated by the species of the grass family.

15. Grassland Vegetation: The type of vegetation that is distributed in the temperate zone, where the amount of rainfall and/or groundwater is higher than the steppe, tallgrasses are dominant and there are a few woody plants.

In terms of agricultural production and use, humid areas with tallgrasses harvested to be used as animal feed are characterized as mown grasslands. In terms of vegetation, herbaceous vegetation in the areas surrounding the wetlands and the vegetation that grows in the humid areas above the tree border are considered as grassland.

16. Grazing: Letting livestock by dispersing in rangelands, highlands, and meadows.

17. Gypsum Steppe: They are steppes that occur on soils with high gypsum content and they have a high rate of endemism.

Major gypsum steppe areas in Turkey are the region between Nallıhan-Beypazarı-Ayaş-Polatlı-Sivrihisar, the region between Kayseri and Sivas (especially around Akkışla), the region between Narman and Tortum, Hafik-Zara and Çankırı.

18. High Mountain Steppe: They are steppes dominated by thorny plants such as milkvetches (Astragalus), prickly thrifts (Acantholimon), which are generally located between 1,600 to 3,000 m.

In Turkey, they are seen in the Eastern Taurus Mountains and higher parts of the mountains in Central Anatolia and Eastern Anatolia Regions.

19. Invasive Alien Species: Species of plants, animals, fungi, and microorganisms that accidentally or deliberately enter or are released into a natural environment, which is not its habitat under normal conditions, and that reproduce, develop, distribute in these environments, causing many adverse effects in their new environment.

20. Low Mountain Steppe: The most common steppe type in Turkey located on the mountain slopes between 800-1600 m, and which generally host soft-leaved plants (malacophyll) and have a floristically-rich composition.

It is seen in the Central, Eastern, and Southeastern Anatolia regions in Turkey.

21. Lowland Steppe: Steppes found on flat or slightly sloped arid lands in Turkey, which are usually dominated by *Artemisia* species.

It is seen in the lowland plains of Central Anatolia and Southeastern Anatolia Regions. Most of the areas that were once lowland steppes in the past have lost this character and have been transformed into agricultural production areas.

22. Malacophyll Steppe: Steppes dominated by herbaceous plants with broad and soft leaves.

The main formation of the low mountain steppe, malacophyll steppes are common in Turkey.

23. Marly Steppe: They are steppes with a high rate of endemism, seen in calcareous, white soils with a high rate of clay.

Ayaş, Beypazarı, Polatlı, Sivrihisar, Yunus Emre, Mihaliççık, Hafik, Zara, Çankırı and Kırşehir are the regions where marly steppes are seen.

24. Natural Steppe: Steppes located in regions where ecological conditions such as climate, soil and geomorphological features do not allow tree growth and natural forests.

25. Overgrazing: It is intensive grazing for long periods of time without allowing the natural vegetation to recover, which causes deterioration of the vegetation structure and decrease of plant diversity.

26. Pasture: See Rangeland.

27. Rangeland: It is the place that has been allocated for grazing of livestock and for producing forage plants or that has been used for this purpose for hundreds of years.

While steppe is a type of vegetation, rangeland is a form of land use.

28. Rangeland Dependent Livestock: It is a form of animal husbandry in which it is essential to feed animals outdoors, with plants that grow naturally on rangelands, and with additional feeding in certain periods.

29. Salt-tolerant (Halophytic) Steppe: They are the steppes formed by salt-tolerant plants (halophytes), which grow on salty soils, dominated by species belonging to the Amaranth (Amaranthaceae) and Leadworts (Plumbaginaceae) families.

In Turkey, they are seen around the salt lakes and salt marshes in Lake Tuz, Seyfe, Burdur, Konya plain, Acıgöl, Develi closed basin, along Aras Valley from Kağızman to Iğdır-Aralık, on salty areas between Kırıkkale-Balışeyh, Çorum-Sungurlu, Yozgat-Yerköy, around Çankırı, and around Balıkdamı and Kavuncu lakes in Eskişehir, around Kayseri Tuzla Lake and Nallıhan-Davutoğlan.

30. Semi-Arid Climate (Semi-Desert Climate): Climate type that is characterized by an average rainfall of between 250 and 500mm.

31. Serpentine Steppe: Steppes with serpentine (ultramafic rocks) soil rich in heavy metals such as magnesium, iron, nickel, chromium, which have poor vegetation and a high endemism rate since this soil is not suitable for plant growth.

In Turkey, serpentine steppes are found around Kütahya, Balıkesir, between Adana - Erzincan, Gölbaşı-Ankara-Kırıkkale and Doğanşehir and in Muğla, Antalya, Mersin and Hatay along the Taurus Mountains.

32. Steppe: It is a type of vegetation distributed in the temperate zone, which generally receives an average annual rainfall of 300-500 mm, has low groundwater, dominated by xerophytic herbaceous plants and less woody plant cover.

It is seen in the interior parts of North America, southeast of South America, south of Africa, extending from China to Eastern Europe in Asia. While the term steppe is generally used in the

Palaearctic Region, different names can be used in the above-mentioned regions (pampas in South America, prairie in North America, veld in South Africa).

33. Steppe Climate: It is the climate seen in the interior parts of the continents where summer months are hot, arid and semi-arid, and winter months are cold, the temperature difference between the seasons is high and rainfall is low.

34. Steppe Culture: It is a lifestyle that emerged as a result of human adaptation to the steppe ecosystem through its culture.

35. Steppe Ecosystem: It is a dynamic system in which the plant, animal and microorganism communities specific to the steppe and their inanimate environment interact as a functional unit.

36. Steppe Species: The species that adapted to the steppe conditions and whose existence depends on the steppe.

37. Steppe Vegetation: Vegetation adapted to steppic conditions.

38. Succession: See Successional Change.

39. Successional Change: The change in the structure, composition, processes, relationships, and other characteristics of a community or ecosystem over time (see Succession).

40. Thorn-cushion (Tragacanthic) Steppe: Steppes dominated by thorny cushion forming plants, such as milkvetch (*Astragalus*), and prickly thrift (*Acantholimon*).

41. Transhumance: A semi-nomadic rural lifestyle that people generally lead on high mountain plateaus far from the village in line with the nutritional needs of their animals in the summer months.

42. Wooded Steppe: Steppes with tree and shrub cover below 40%.

Different names may be given by different specialties for the same field or formation, for example; the place we call a wooded steppe can be named as "Degraded Forest", "Closed Forest with Gaps" in terms of forestry or "Sparse Forest" in terms of ecology. However, in this study, the terms used with regard to steppes are explained.

9. Glossary

Adaptation	Action by which living things become suited to new or changing conditions in natural or semi-natural systems.
Adaptation to climate change	The process of developing, strengthening and implementing strategies to combat the effects of climate events (risks), gain benefits and manage effects
Biodiversity	“The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.” (CBD, 1992)
Biogeography	The discipline that studies the geographical distribution of organisms and the geographical factors that affect that distribution.
Biological control	The struggle to keep the harmful agent below a level to cause economic injury by using other living organisms against plant pests, diseases and weeds.
Biological resources	Biological resources include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity (CBD).
Climate-smart agriculture	An approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. It aims followings: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible (FAO).
Desertification/land degradation	The land degradation in arid, semi-arid and sub-humid areas resulting from various factors, including climatic variations and human activities. Decline in the biological and economic productive capacity of agricultural fields, rangelands and forests or the complete disappearance of productivity in these areas, resulting in processes such as land degradation, soil erosion caused by the effect of wind and/or water in arid, semi-arid and sub-humid areas, loss of soil in physical, chemical, biological or economic terms, and loss of vegetation on the soil and resulting from land use processes (UNCCD).

<p>Drought (Aridity)</p>	<p>A naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems. It is divided into meteorological drought and agricultural drought (UNCCD).</p>
<p>Eco-friendly agriculture</p>	<p>Practices and applications that protect soil and water resources and their quality, support biodiversity, reduce environmental impacts such as pesticides, pollution, soil erosion and greenhouse gas emissions. The goals are sustainable agricultural productivity and increased income, building adaptation and resilience to climate change, and if possible, the reduction and/or elimination of greenhouse gas emissions.</p>
<p>Ecological corridor</p>	<p>Natural or artificially designated connection areas that allow an exchange of species by ecologically connecting habitats in geographic regions close to each other.</p>
<p>Ecological zone</p>	<p>Large terrestrial or aquatic areas that are ecologically and geographically defined, unique in terms of their environmental conditions and species they host.</p>
<p>Ecosystem</p>	<p>A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (CBD 1992).</p>
<p>Ecosystem-based adaptation</p>	<p>The use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change (CBD 2009).</p>
<p>Ecosystem-based management</p>	<p>An approach to maintaining or restoring the composition, structure, function, and delivery of services of natural and modified ecosystems for the goal of achieving sustainability. It is based on an adaptive, collaboratively developed vision of desired future conditions that integrates ecological, socioeconomic, and institutional perspectives, applied within a geographic framework, and defined primarily by natural ecological boundaries (MEA 2005). https://www.biodiversitya-z.org/content/ecosystem-based-management</p>

<p>Ecosystem services</p>	<p>Benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as regulation of floods, drought, land degradation, and disease; supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, religious and other non-material benefits (MEA 2005). By IPBES (2019), “Nature's Contributions to People” has been started to be used instead of “Ecosystem Services”, which allows to understand the relationship and interaction between people and nature with a more comprehensive understanding.</p> <p>https://www.biodiversitya-z.org/content/ecosystem-services</p>
<p>Endemic</p>	<p>Originates from the Greek word “endomos” and means “native, restricted to a certain place”. Plant or animal species found only in a certain geographical area.</p>
<p>Ex-situ conservation (Off-site conservation)</p>	<p>The conservation of components of biodiversity outside their natural habitats (CBD 1992).</p>
<p>Food security</p>	<p>Food security is all individuals' ability to access to adequate, safe and nutritious food in physical, social and economic terms to meet the nutritional needs and food preferences required for an active and healthy life at all times. Food security is generally defined with 4 main components: availability, access, utilization, and stability.</p>
<p>Gender mainstreaming</p>	<p>Regardless of their gender in all areas of life, that individuals have equal opportunities, equal rights, equal treatment and chance to develop personal knowledge and skills in all areas they want and to make choices. Equality can be achieved if gender-based inequalities are eliminated, equal social values, equal rights and equal responsibilities are given to each individual regardless of their different gender status, and individuals have equal access to resources (opportunities) to use them.</p>
<p>Genetic resources</p>	<p>Genetic material of actual or potential value (Any material of plant, animal, microbial or other origin containing functional units of heredity) (CBD 1992).</p>
<p>Grazing plan</p>	<p>Implementation plan specifying details such as grazing season, grazing capacity, grazing system, type and amount of grazing animals, starting and ending dates of grazing in relation to the regular grazing in the rangelands, summer pastures, winter pastures and public meadows and grasslands (definition in the legislation).</p>
<p>Habitat</p>	<p>The place or type of site where an organism or population naturally occurs (CBD 1992).</p>

Halophyte	A salt-tolerant plant that grows in soil or waters of high salinity, salt marshes, and places where salt water is sprayed with the effect of the wind.
Holistic grazing management / Holistic planned grazing	A flexible and proactive grazing planning method that provides the opportunity to include ecological restoration and socio-economic gains in the planning process, prevents overgrazing by giving the plants adaptive recovery time to the season, generally creates a strong hoof effect with high herd density, and can be applied in all scales and climates. It has been developed by the Zimbabwean biologist Allan Savory (Savory Institute), inspired also by grazing under predator pressure of wild herds and their perpetual motion patterns.
<i>In-situ</i> conservation (On-site conservation)	The conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties (CBD 1992).
Integrated pest management (integrated pest control)	Pest management system to keep pest populations below a level causing economic injury, by taking into account their population dynamics in cultivated plants and their relations with the environment, using appropriate control methods and techniques (definition in the legislation).
Land consolidation	Preventing land degradation and fragmentation with natural and artificial effects, establishing more functional new parcels economically, ecologically and socially by combining more than one parcel taking into account natural features, integrity of use and property rights in fragmented lands and determining the forms of utilization of these parcels by evaluating the land characteristics and area, providing village and land development services (definition in the legislation).
Land degradation neutrality (LDN)	A state whereby the amount of healthy and productive land resources, necessary to support the ecosystem functions and services, remains stable or increases within the specified temporal and spatial scales (UNCCD).
Medicinal and aromatic plant	All plants and plant parts mainly used in perfumery and pharmacy. They are used as fresh, dried, cut, uncut, crushed, powdered or other similar substances.

<p>No-till farming (direct drilling)</p>	<p>The method that allows planting at once without tillage before planting. In no-tillage farming, unlike traditional practices, no tillage is carried out until re-seeding after harvest and the seeding is carried out with special grain drills that can plant on the area covered with stubble belonging to the previous crop. This method increases productivity and profitability, contributes to food security and is also climate and environmentally friendly.</p>
<p>Plowless farming</p>	<p>Practice of dibbling or planting forage crops directly into a field (agriculture or rangeland area) with no plowing performed after harvesting the previous crop.</p>
<p>Rangeland improvement</p>	<p>Taking and implementing various physical and technical measures aimed at facilitating grazing, soil and water conservation as well as irrigation, fertilization, weeding, seeding and similar biological techniques to enhance rangelands, summer pastures and winter pastures and public meadows and grasslands in terms of feed efficiency and quality (definition in the legislation).</p>
<p>Rangeland management</p>	<p>A rangeland planning and management style based on scientific data, without damaging the vegetation, soil, water and other natural resources in order to benefit from rangelands, summer pastures, winter pastures and public meadows and grasslands in the most convenient way.</p>
<p>Regenerative rangeland management</p>	<p>The set of practices and planning processes that enable meadows, grasslands and steppe ecosystems to reach more resilient, productive and higher biodiversity than existing ones through the use of holistic grazing management (holistic planned grazing) in addition to their grazing planning. Beyond sustainability, this establishes positive feedback “win-win” processes, with economic gain and ecological restoration taking place together.</p>
<p>Rehabilitation</p>	<p>Measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimized. Rehabilitation emphasizes the reparation of ecosystem processes, productivity and services, whereas the goals of restoration also include the re-establishment of the pre-existing biotic integrity in terms of species composition and community structure. https://www.biodiversitya-z.org/content/rehabilitation</p>
<p>Restoration</p>	<p>The returning process of an ecosystem or habitat that has been degraded, damaged, or destroyed, to its original coexistence structure, the natural integrity of the species and their natural functions. https://www.biodiversitya-z.org/content/restoration</p>

Rotation of crops (crop alternation)	The practice of growing a series of different types of crops in succession in certain order on the same land. This improves soil quality, increases soil productivity, and reduces threat of plant diseases and erosion.
Rotational grazing	Grazing the animals on certain parcels of rangelands and grasslands for certain periods, according to the calculated carrying capacity. This allows the animals to be grazed in certain parts of the rangelands at certain periods, while the other parts are rested and developed until it is the grazing turn.
Silvopastoral	The management system where trees and grass and grazing lands are located together on the same land and that envisages to benefit from both sources together. The trees provide shade and protection for animals as well as wood while the grazing lands provide more animal yield and income than similar treeless areas. In silvopastoral areas, usually ovine animals (sheep, goats) are grazed. Silvi-pastoral systems also contribute positively to wildlife, water quality, soil productivity, and conservation of soil from water and wind erosion.
Steppe forest	Areas forming sparse or closed forests in ecological regions dominated by steppes.
Stubble burning	Burning the roots and straws that remain in the field after harvest. This causes loss in humus and moisture in soils and acceleration of erosion.
Sustainable land management	The use of land resources, including soil, water, animals and plants, to provide products to meet the changing needs of people, as well as to ensure the long-term conservation of the productive potential of these resources and the continuity of their environmental functions. Sustainable land management aims to increase the economic and social well-being of the affected communities, maintain the services provided from the ecosystem, and strengthen the adaptive capacity to manage climate change.
Sustainable use	The use of components of biodiversity in a way and at a rate that does not lead to the long-term decline of biodiversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations (CBD 1992).
Systematic conservation planning	Systematic Conservation Planning (SCP) is the process of establishing a conservation management system with clearly defined conservation objectives that the entire biodiversity is represented in a permanent (long-term) manner and not limited to protected areas. A conservation system is planned at regional and/or national scales by using biological and socio-economic data together.

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ANNEX 1. Analysis of Legislation and Top Policy Documents

INTERNATIONAL CONVENTIONS and PROGRAMS

Title of the Convention	Scope of the Convention
<p>The Convention on Biological Diversity (CBD, 1997)</p>	<p>It aims at the conservation and sustainable use of biodiversity and the fair sharing of benefits derived from the use of genetic resources.</p> <p>In the 10th Meeting of the Conference of the Parties to the Convention, the Biodiversity Strategic Plan and the 2020 Biodiversity Targets, which are called Aichi Targets, were accepted for the main purpose of halting the loss of biodiversity in the world until 2020. The vision of the Strategic Plan is a world of “Living in harmony with nature” where “By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people”. The Strategic Plan includes targets for 2015 or 2020 in 20 headlines ("Aichi Biodiversity Targets") that are organized under five strategic goals.</p> <p>These goals and targets include mainstreaming biodiversity concerns throughout government and society and addressing the underlying causes of biodiversity loss; the reducing the pressures on biodiversity and promoting its sustainable use; improving the status of biodiversity by safeguarding ecosystems, species, and genetic diversity; enhancing the benefits derived from biodiversity and ecosystems for all (the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising From Their Utilization comes into force); enhancing implementation through participatory planning, knowledge management, and capacity building.</p> <p>It sets out the framework for means to address the conservation and sustainable use of steppe biodiversity.</p>

Title of the Convention	Scope of the Convention
<p>The Convention on Biological Diversity Programme of Work</p>	<p>The Conference of the Parties to the Convention on Biological Diversity (COP) has established 7 thematic programmes of work that correspond to the main biomes on the planet. Two of these are associated with the conservation and sustainable management of steppe biodiversity.</p> <p>Arid and semi-arid lands programme of work (decision V/23, Annex 1) comprises objectives related to assessments of the status and trends of biodiversity in arid lands, Mediterranean, arid, semi-arid, grassland and savannah ecosystems, building knowledge on ecological, physical and social processes, identifying local and global benefits, identifying examples of good management including knowledge, innovation and practices of local people and promoting specific measures for the conservation and sustainable use of biodiversity, promoting a responsible resource management through an ecosystem-based approach, and supporting sustainable livelihoods by diversifying livelihoods, sustainable harvesting, innovative and sustainable use of biodiversity.</p> <p>The objectives of the agricultural biodiversity programme of work (decision V/5, annex) are assessment of the state and trend of agricultural biodiversity, underlying causes of change and knowledge of management practices; determining adaptive management techniques, practices and policies; capacity building, raising awareness and promoting responsible actions, and mainstreaming national plans and strategies to relevant agricultural policies for the conservation and sustainable management of agricultural biodiversity.</p>
<p>United Nations Framework Convention on Climate Change (UNFCCC,2004)</p>	<p>It encourages parties to cooperate in the international arena against the effects of global warming on the climate, caused by human-induced activities, to reduce greenhouse gas emissions, to cooperate on research and technology, and to protect greenhouse gas sinks.</p> <p>The management of sensitive natural resources such as steppe ecosystems and the adaptation of these ecosystems to climate change is important. As stated in Article 2, the natural adaptation of the ecosystem to climate change is one of the objectives of the convention.</p>

Title of the Convention	Scope of the Convention
<p>United Nations Convention to Combat Desertification (UNCCD, 1998)</p>	<p>It provides long-term strategies and objectives on land restoration and rehabilitation, sustainable land management and sustainable management of water resources to combat desertification/land degradation and drought. The UNCCD 2018-2030 Strategic Framework Document defines a vision of a future that avoids, prevents and reverses desertification/land degradation and mitigates the effects of drought in affected areas and neutralizes land degradation in line with the UN 2030 Sustainable Development Goals. Strategic Objectives 2, 3 and 4 are determined as improving the conditions of affected ecosystems, combating desertification/land degradation, promoting sustainable land management and contributing to the stabilization of land degradation, increasing the drought resistance of fragile ecosystems and contributing to biodiversity and climate change issues.</p> <p>Steppe areas, many of which are of rangeland characteristics, are faced with land degradation and there is a biological/ecological and economical decrease or loss of productivity in these areas. Therefore, strategies, objectives, approaches and practices within the scope of the convention are important for steppe ecosystems.</p>
<p>Sustainable Development Goals (2015)</p>	<p>Sustainable Development Goals (SDG), otherwise known as the Global Goals, consist of 17 Goals to eliminate poverty, protect our planet and ensure that all people live in peace and prosperity. In relation to the conservation and sustainable management of steppes, Global Goal 15 has been determined as “To protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”. Under this goal, there are targets related to the conservation of terrestrial ecosystems, their sustainable use and restoration, the conservation of habitats and species, the fair and equitable sharing of the benefits gained from the use of genetic resources, and the promotion of access to such resources, the prevention of illegal hunting and smuggling, the provision of financing and the provision of sustainable livelihoods to local people.</p>

Title of the Convention	Scope of the Convention
<p>IPARD Framework Agreement and Sectoral Agreements</p>	<p>IPARD is the Rural Development component of the Instrument for Pre-Accession Assistance, established by the European Union (EU) to support candidate and potential candidate countries.</p> <p>It aims to support the harmonization initiatives for the implementation and management of the Common Agricultural Policy, Rural Development Policy and related policies of the European Union and policy development in this context. It is important for the opportunities it creates to compensate agricultural producers for loss of income arising from their commitments to conserve the environment and natural resources.</p>

NATIONAL LAWS and REGULATIONS

Legislation	Scope of the Legislation	Relevance to the Steppes
Pasture Law (No. 4342 of 25.02.1998)	The law includes determination of rangelands, summer pastures, winter pastures, and public rangelands and meadows, allocating them to the legal entities of the village or municipalities, utilizing them in line with the rules to be determined, their maintenance and rehabilitation, increasing and sustaining their productivity, supervising their use regularly, protecting them and changing the purpose of use when necessary.	Most of the steppe areas are classified and managed as rangelands. This law not only provides the protection of rangelands but also determines the basic principles of their utilization.
Pasture Regulation (No 23419 of 31.07.1998)	The principles and procedures for the implementation of the Law on the Amendment of Some Articles of the Pasture Law No. 4368 dated 11.06.1998 are regulated by the Pasture Law No. 4342 and 25.02.1998. It includes administrative and managerial provisions regarding the restriction and allocation of rangelands, meadows and summer pastures, and grazing plans.	The Pasture Law has been elaborated by addition of paragraphs to some of its articles. The elaboration of the Pasture Law also regulates the protection-utilization principles of the meadows, rangelands, summer pastures or other areas mentioned in the law that may be related to steppes.
Forest Law (No. 6831 of 31.08.1956)	It includes principles for planning, operating forests, and conservation of forests and its ecosystems.	It constitutes the framework for the management, development and protection of "degraded forests", which are of steppe nature. In this respect, it is closely related to the improvement and conservation of the steppe areas or the degradation of the steppe vegetation. In addition, it includes the prevention of soil erosion and reducing the negative pressures of grazing on forests by means of rehabilitation works in in-forest, forest edge and upper forest line.

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Forest Management Regulation (Official Gazette No. 26778 of 05.02.2008)</p>	<p>It aims to determine the procedures and principles regarding the inventory of the state forests, forests belonging to the legal entities and private forests, the arrangement, renewal, interim inspection, implementation of the management plans, changes in the plan, and performing or arranging the inspection.</p>	<p>It implements the ecosystem-based functional planning approach, which takes into account the economic, ecological, social, and cultural functions of forests, with the management plans. As a result of the biodiversity inventories, forestry activities are carried out according to the biological characteristics and ecological demands of those species in places where important, endangered, rare, and endemic species and similar sites are identified.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>National Afforestation and Erosion Control Mobilization Law (No. 4122 of 23.07.1995)</p> <p>Regulation on Forest Services on Afforestation and Erosion Control (Official Gazette No. 29945 of 11.01.2017)</p> <p>Regulation on Afforestation (Official Gazette No. 30927 of 23.09.2019)</p>	<p>It regulates the principles and procedures of afforestation and erosion control works to be carried out by public institutions and organizations and real and legal persons in order to increase the forest area and tree wealth, to establish and improve the balance between soil, water and plants, and to conserve environmental values.</p> <p>Afforestation, rehabilitation, erosion and flood control, prevention of avalanches and landslides, rangeland rehabilitation, tree rehabilitation, seed and seedling production, nursery and reconstruction works to increase forest area, increase biodiversity and rebuild the degraded forest ecosystem. It includes the arrangements for the regulation of the expenditures to be made for the restoration works and the collection of the revenues.</p> <p>To regulate the procedures and principles regarding afforestation, rehabilitation, erosion and flood control, prevention of avalanches and landslides, rangeland rehabilitation, tree rehabilitation, production of seeds and seedlings of forest trees, shrubs, and flora, nursery and reconstruction works.</p>	<p>It is important that it includes provisions on special afforestation, including in degraded forest areas, areas reserved by grazing plan, and passage roads to summer pastures and winter pastures, which have been used since ancient times, in terms of rehabilitation works in forests, forest edges and upper forest line rangelands and prevention of soil erosion.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Environment Law (No. 2872 of 09.08.1983)</p>	<p>It includes the relevant procedures in order to protect the environment, which is the common asset of all living things, in line with the principles of sustainable environment and sustainable development. The Law regulates the permissions to polluting activities within the scope of the "polluter pays" principle and the penalties to be paid in case of polluting the environment, and it also obliges the activities known to have a polluting effect within the scope of the "Preventive Principle" to carry out Environmental Impact Assessment.</p>	<p>Conservation of biodiversity and the ecosystem that hosts it is essential. Protection of natural elements such as air, water, and soil and prevention of pollution are basically dealt with within the scope of this law.</p> <p>Stubble burning, destruction of meadows and rangelands and all activities that cause erosion are prohibited. However, in the regions where the second crop is planted, controlled stubble burning is allowed within the scope of the action plan prepared by the governorships.</p>
<p>National Parks Law (No. 2873 of 09.8.1983)</p>	<p>It regulates the principles of selection and designation of national parks, nature parks, natural monuments, and nature reserve areas of national and international value, in Turkey and the conservation, development, and management of such places by preserving their features and character.</p>	<p>Natural steppes are within the protected areas. The wildlife hosted by these areas includes provisions on the protection of ecosystem values.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Hunting Law (No. 4915 of 01.07.2003)</p>	<p>It includes provisions regarding the protection and development of game and wild animals together with their natural habitats for sustainable game and wildlife management, to control their hunting, to regulate hunting, to use hunting resources to be beneficial for the national economy, and to cooperate with relevant public and private law legal entities.</p> <p>Within the framework of the law, areas where wild animals that are threatened or are in danger of extinction, are naturally found are protected for the conservation of these species together with their habitats without deteriorating their ecosystem characteristics.</p>	<p>Wildlife protection and breeding areas are established according to this law. Based on the law, the "Regulation on Principles and Procedures for Protection of Game and Wild Animals Together with their Habitats and Prevention of Pests and Diseases" governs the procedures and principles regarding the protection of the habitats of game and wild animals, translocation of species, their placement, protective measures, their collection and capture in nature, management of predatory species and management of their pests and diseases. It also includes provisions on species of game and wild animals, their survival in the natural environment, their protection, protected areas, habitats, capture, collection, scientific research, banding and marking, diseases together with penal provisions.</p>
<p>Law on the Conservation of Cultural and Natural Property (No. 2863 of 21.07.1983)</p>	<p>It determines the definitions regarding the movable and immovable cultural and natural assets that need to be protected and regulates the transactions and activities to be carried out. Natural Conservation Sites are announced according to this Law</p>	<p>Some of the natural steppes are within the protected area. It includes provisions on the conservation of the wildlife hosted by these areas and the ecosystem values.</p>
<p>Regulation on the Protection of Wetlands (No.28962 of 04.04.2014)</p>	<p>Especially for the implementation of the Convention on Wetlands of International Importance as Waterfowl Habitat (Ramsar Convention), cooperation and coordination between institutions and organizations, protection and development of wetlands.</p>	<p>It is important for the protection of wetland ecosystems and for the management of the ecosystem services they provide. Shallow lakes and wetlands intertwined with steppe ecosystems and their ecosystem services are important in terms of conservation.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Regulation on Procedures and Principles (No. 28358 of 19.07.2012) and the Amending Regulation (No. 31070 of 16.03.2020)</p>	<p>It determines the procedures and principles regarding the registration, approval, and announcement of the national park, nature park, natural monument, nature conservation area and wetlands, as well as the determination, registration, approval, change, and the announcement of the natural asset, natural conservation site, and special environmental protection areas. Except for movable natural assets, it covers natural assets, natural conservation sites, special environmental protection areas, national parks, nature parks, natural monuments, nature conservation areas, and wetlands.</p>	<p>Although there is no special protected area status for steppes, steppe ecosystems are included in the current protected areas. The inclusion of potential steppe areas in protected areas and the conservation of steppe species and habitats within existing protected areas is of great importance.</p>
<p>Agriculture Law (No. 5488 of 15.04.2006)</p>	<p>It covers the implementation procedures and principles regarding the determination of the policies necessary for the development and support of the agricultural sector and the rural areas, making regulations, determining the scope and subjects, creating and implementing programs, financing and administrative structuring, priority research and development programs.</p>	<p>The law also includes the conservation and development of natural and biological resources within the objectives of agricultural policies. Most of the steppe areas are classified and managed as agricultural lands and rangelands. In the law, the issue of agricultural basins is included as an explicit provision in order to concentrate, support, organize, specialize, and conduct agricultural production in areas suitable for its own ecology. It contributes to the conservation of the steppes with agricultural supports such as ÇATAK.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Regulation on Agricultural Basins (No. 27695 of 07.09.2010)</p>	<p>It regulates the principles and procedures for carrying out, supporting, organizing, specializing in agricultural activities in an integrated manner in the agricultural basins determined for the development of agricultural production in appropriate ecologies, and preparing the agricultural inventory.</p>	<p>With these practices, it is possible to adapt to changing climatic conditions in effective use, protection and planning of soil and water resources.</p>
<p>Decision and Communiqué on Supporting Agricultural Investments within the Scope of Rural Development Supports (21.10.2016 and 13.09.2017)</p>	<p>Its purpose is to determine the principles and procedures for supporting small and medium-sized enterprises in order to ensure the integration of agricultural production and agriculture-based industry with a focus on conserving natural resources and the environment, developing agricultural marketing infrastructure, strengthening food security, creating alternative income sources in rural areas, strengthening rural economic infrastructure, promotion of new technologies developed for agricultural activities by the producers and supporting investments involving new technology.</p>	<p>Practices such as supporting livestock-oriented rural development, implementing conservation-oriented measures such as rangeland rehabilitation, popularizing new technologies such as efficient irrigation systems, increasing the value chain in animal products contribute to the conservation of steppes.</p>
<p>Communiqué on Implementation Principles Regarding Livestock Supports (No. 016/26 of 24.06.2016)</p>	<p>Its purpose is to develop animal husbandry in Turkey, to provide increasing and sustaining healthy production, to conserve genetic resources of domestic animals in situ and develop them, keeping the records system up-to-date, to increase the efficiency of livestock policies, and to support the breeders in animal disease control.</p>	<p>It determines the supports for all kinds of animal husbandry including apiculture. It can provide the necessary support to handle livestock in a more efficient and sustainable way.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Soil Preservation and Land Utilization Law (No. 5403 of 19.07.2005)</p> <p>Law of Amendment on Soil Preservation and Land Utilization Law (No. 6537 of 15.05.2014)</p>	<p>It determines the procedures and principles that will ensure the planned land use in accordance with the principle of sustainable development and environmental priority by preventing the loss of the soil and its qualities.</p> <p>In this context, the law includes provisions on making land use plans, preparing land use plans and projects for agricultural purposes, preparing soil conservation projects, identifying and protecting large plains with high agricultural potential, determining and protecting areas susceptible to erosion, monitoring and prevention of soil pollution, land consolidation and distribution, penalties for misuse of agricultural lands, and penalties for non-agricultural land uses.</p> <p>The smallest agricultural parcel size according to provinces and districts is defined in order to determine the minimum agricultural land and the agricultural land with sufficient income and to prevent their division. Agricultural lands that have reached the minimum size determined by this law have become indivisible goods.</p>	<p>Any intervention aimed at protecting agricultural lands, including agricultural lands with steppe ecosystems, particularly the opening of natural steppes to agriculture, is related to the Law on Soil Preservation and Land Utilization.</p> <p>Studies on land size and management efficiency will increase productivity and reduce the use and cultivation of marginal lands.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Regulation on Conservation, Use and Planning of Agricultural Land (09.12.2017)</p>	<p>Its purpose is the determination of the land and land assets foreseen in the Law on Soil Preservation and Land Utilization No. 5403 dated 3.7.2005, classification and development of agricultural lands, allowing for unintended use in case of necessity, determining and protecting the soil and large plains with high agricultural production power, soil preservation plans and preparation and implementation of projects, determination of areas susceptible to erosion, the formation of the soil preservation board, its duties, works and the planned use of lands in accordance with the environmental priority principle of sustainable development.</p> <p>Within the scope of the Regulation, Soil Preservation Boards established in each province have important duties to protect, develop and utilize agricultural lands efficiently, land use, improvement of land properties, conservation and recovery, and realization of soil preservation measures</p>	<p>It is among the regulations that contribute to the sustainability of agricultural biodiversity.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Regulation on the Support of the Producers Using Agricultural Techniques for the Protection of the Environment and Providing Technical Assistance (No. 25994 of 15.11.2005)</p>	<p>It aims to support producers who prefer to use agricultural production techniques to protect the environment, to reduce the negative effects of agricultural practices on the environment, to prevent erosion, to maintain renewable energy resources, and to protect the natural cover and soil and water quality in vulnerable areas.</p>	<p>Agriculture with minimal tillage is an important program for the protection of the soil and water structure, prevention of erosion, environmentally friendly agriculture techniques, and the conservation of the steppes.</p>
<p>Organic Agriculture Law (No. 5262 dated 03.12.2004)</p> <p>Regulation on the Principles of Organic Farming and Their Implementation (18.08.2010)</p>	<p>It determines the procedures and principles for taking the necessary measures to improve the production of organic products and inputs in order to provide reliable, quality products to the consumer.</p> <p>It covers the performance of control and certification services related to the execution of organic farming activities and the inspection procedures and principles of the Ministry, as well as the issues regarding powers, duties and responsibilities.</p> <p>Preserving the ecological balance, conducting organic agricultural activities, regulating, developing and disseminating organic agricultural production and marketing.</p>	<p>It is one of the most powerful tools to control the use of fertilizers in agricultural production. Since it does not allow the use of chemicals, the practice of organic agriculture provides an important opportunity for the protection and improvement of soil and water resources.</p>
<p>Regulation on Good Agricultural Practices (No. 27778 of 07.12.2010)</p>	<p>It aims to ensure an agricultural production that does not harm the environment, human and animal health, conservation of natural resources, traceability and sustainability in agriculture, and reliable product supply.</p>	<p>Good agricultural practices are important in terms of conserving soil and water resources and ensuring more sustainable use.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
<p>Protection of Waters Against Nitrate Pollution from Agricultural Sources (23.07.2016)</p> <p>Good Agricultural Practices Code for Protection of Waters Against Nitrate Pollution from Agricultural Sources (No. 2016/46 of 11.02.2017)</p>	<p>It aims to detect, reduce and prevent the pollution caused by agricultural nitrate in water. The regulation covers the technical and administrative principles regarding the determination and control of nitrogen and nitrogen compounds that cause pollution in underground, surface waters and soils, and mitigation of pollution.</p> <p>It contains the rules and application principles that must be followed by farmers in areas that are nitrate-sensitive or not.</p>	<p>The regulation supports steppe ecosystems by adopting good agricultural practices in the use of fertilizers (appropriate periods of fertilizer applications, amount of fertilizer to be used according to climate and soil conditions, plant rotation systems, irrigation, etc.).</p>
<p>Regulation on Organic, Mineral and Microbial Fertilizers Used in Agriculture (23.02.2018)</p>	<p>Its purpose is to determine the procedures and principles to improve the physical, chemical and biological structure of soils, to increase productivity in plant production, to protect human health and to mitigate environmental pollution, to promote the use of organic, mineral, and microbial fertilizers, to define and to determine the analysis methods for these products and to import, export, produce, supply to the market and to record these products.</p>	<p>It supports steppe ecosystems with the use of organic, mineral and microbial fertilizers.</p>

Legislation	Scope of the Legislation	Relevance to the Steppes
Biosafety Law (No. 5977 of 26.03.2010)	Its purpose is to determine, within the framework of scientific and technological developments, the procedures and principles to prevent the risks that may arise from genetically modified organisms and their products obtained by using modern biotechnology, to establish and implement a biosecurity system, to control, regulate and monitor these activities in order to protect and maintain human, animal and plant health, environment and biodiversity.	It is an important law in terms of protecting natural ecosystems and gene resources. It also forms the basis for biological solutions that can be used to reduce greenhouse gases.
Law on Veterinary Services, Plant Health, Food and Feed (No. 5996 of 11.06.2010)	It aims to protect and ensure food and feed safety, public health, plant and animal health, animal breeding and welfare, taking into account consumer interests and the protection of the environment.	It is a legal instrument regulating the fight against harmful organisms in plants and plant products. It is important to protect water resources from agricultural pollutants.
Feed Law (No.1734 of 07.06.1973)	It sets out the procedures and principles for the preparation of feeds to be supplied to production, market, import, and export in order to ensure rational livestock nutrition and to improve animal production.	The law determines the qualities that forage crops should have and includes provisions on rangeland and forage crop production.
Seed Law (No. 5553 of 08.11.2006)	It aims to increase the yield and quality in crop production, to provide quality assurance to seeds, to make regulations on seed production and trade, and to restructure and develop the seed sector.	It includes the sustainability of natural resources and the protection of agricultural ecosystems through certification in seeds and the use of suitable seeds. It is especially important in terms of protecting the gene resources required for adaptation in the medium and long term.

Legislation	Scope of the Legislation	Relevance to the Steppes
Regulation on collection, production and marketing of natural flower bulbs (No. 30014 of 21.03.2017)	It regulates the procedures and principles for the collection, production, harvesting, storage and export of seeds, onions, tubers, rhizomes, corms or other parts for the protection of natural flower bulb species.	It is an important tool to be considered in the conservation of steppe plant diversity.
Regulation on the Collection, Preservation and Use of Plant Genetic Resources (No. 21316 of 15.08.1992)	It is designed to establish the principles of the survey, collection, storage, production, renewal, characterization, evaluation, documentation, and change of collected materials, with the aim of the preservation and development of plant genetic resources of Turkey.	It is related to the conservation of steppe plant diversity.
Regulation on Protection of Animal Genetic Resources (No. 25145 of 21.06.2003)	The aim of this regulation is to set forth the procedures and principles of the determination of the genotypic and phenotypic characteristics of animal genetic resources of Turkey, breeding with the purpose of protecting such properties, recording, and protecting them.	It is related to the conservation of steppe animal diversity.
Agricultural Insurance Law (No. 5363 of 21.06.2005)	It regulates the rules for the establishment of agricultural insurance in order to compensate the losses of the producers against agricultural risks.	It is an important tool in terms of ensuring the sustainability of production in agriculture. Addressing sustainable agriculture and livestock practices within the scope of insurance can reduce the risk factor associated with new ventures.

Legislation	Scope of the Legislation	Relevance to the Steppes
Law on the Assistance to Farmers Who Have Suffered Losses Due to Natural Disasters (No. 2090 of 05.07.1977)	It provides necessary assistance to farmers who suffer from natural disasters such as storm, flood, overflow, frost, hail, drought, pests and diseases.	It is important in terms of ensuring sustainability in agricultural production by supporting farmers who suffer economic losses due to natural disasters.
Law on land reform regarding rearrangement of land in irrigated areas (No. 3083 of 01.12.1984)	It aims to develop practices based on the efficient operation of irrigation areas and areas with high agricultural potential. It covers all measures such as land distribution and change, consolidation, in-field development services, and management of irrigation investments. For this purpose, it has strong powers, including the distribution of the lands in the hands of the State, expropriation, allocation of agricultural land for different purposes according to the public benefit.	The law specifically includes arguments suitable for the development of policies that take into account climate change in irrigation areas. Its guiding effect on the use of water resources is important.
Regulation on Land Consolidation and In-Field Development Services Implementation (07.02.2019)	It determines the principles and procedures regarding the consolidation of agricultural lands and in-field development services.	It is possible to lose habitat parts that are important as ecological corridors for steppe species through land consolidation works.
Regulation on Preparation of Protection of Water Basins and Preparation of Management Plans (28.10.2017)	It covers the principles and procedures for the protection of basins where surface and ground water resources, including coastal waters, excluding seas, and preparation of management plans.	It is an important tool for the integration of agricultural practices that support steppe ecosystems into basin management plans.

Legislation	Scope of the Legislation	Relevance to the Steppes
Communiqué on Prevention of Stubble Burning	Governorships issue Communiqués on Principles and Procedures for Prevention of Stubble Fires for provinces every year and their implementations are closely monitored.	The protection of steppe ecosystems and soil assets is important in terms of mitigation and preservation of soil carbon. Opportunities for the expansion of conservation agriculture (direct stubble seeding) activities.
Communiqué on the Execution of Combine-Harvester Control Services	Governorships annually issue a Governor's Office Communiqué on the Execution of Combine-Harvester Control Services for provinces and monitor their implementation. It covers the procedures and principles regarding the operation and utilization of combine-harvesters, and the execution and inspection of control services, to protect public order and public trust by ensuring that the field crops are harvested in a timely manner, with the least product loss, keeping the product losses and damages at the lowest level, and preventing uneducated and unequipped combine-harvester services.	It should be taken into consideration in terms of conservation agricultural practices by reducing the pressure on natural resources with faster and timely harvesting.

NATIONAL DEVELOPMENT PLANS

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<p>Eleventh Development Plan (2019-2023)</p>	<p>The term "steppe" ("<i>bozkır</i> or "<i>step</i>", in Turkish) is not mentioned in the Eleventh Development Plan. However, there are related policies and measures that will contribute to the protection and sustainable management of steppe ecosystems under the headings of "Agriculture", "Urban Infrastructure", "Rural Development", "Protection of the Environment".</p> <p><i>"Agriculture" under the "Competitive Production and Productivity" axis</i></p> <ul style="list-style-type: none"> -To ensure protection, effective use and management of agricultural lands (405) -To disseminate modern irrigation systems such as sprinkling and drip irrigation to ensure efficient use of water in agriculture. (406.3) -To support good agricultural practices, organic farming, contract farming, clustering, research, marketing and branding activities, in order to increase product reliability, diversity and production, particularly for high value added medical and aromatic plants (407.2) -To accelerate the determination, restriction and registration processes for rangeland, summer pasture and winter pastures, to ensure that the rangelands are rehabilitated to boost the production of high-quality forage crops and to support forage crop production. (408.4) -To increase the inspection and training activities to combat senseless pesticide use in plant production and to support and disseminate biological and biotechnical combat practices alternative to chemical practices. (410.4) -To ensure conservation and sustainability of biodiversity in the field of local animal breed and seed in agricultural production. (412) -To complete the biodiversity inventory, to monitor important species and specific areas, to establish a mechanism for sharing benefits from genetic resources and related traditional information, to record traditional biodiversity-based information and to make them available for R&D purposes. (412.1) -To make arrangements for the establishment of accredited nature farms in order to ensure sufficient quantity of local breed animal and seed assets. (412.2.) -Reproduction of local seeds of fruits, grains, medicinal and aromatic plants, especially winter vegetables, and local animal breeds in nature farms and transforming them into sustainable value-added products. (412.3.)

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	<p>-To make local products, geographically marked agricultural products and medicinal and aromatic products subject to trade by increasing the product value through improvements in promotion, marketing, and branding. (414.1)</p> <p>-To support the studies conducted in research institutes especially in the areas of animal and plant breeding, biotechnology, and biodiversity conservation within the framework of public institutions, university, and private sector cooperation. (416.2)</p> <p>-To develop and support innovative and environmentally-friendly production techniques, especially smart agricultural technologies. (416.4)</p> <p><i>Under the "Livable Cities, Sustainable Environment" axis, "Urban Infrastructure", "Rural Development", and "Environmental Protection"</i></p> <p>-Implementation of basin-based plans, strategies and action plans in integrity within the scope of protection, development and sustainable use of water resources (697)</p> <p>-To program rural development supports with a focus on farmers and the environment, to make arrangements to eliminate the existing multi-headedness in the execution of supports, to ensure complementarity and effectiveness in practice. (707)</p> <p>-To keep rural heritage alive and to protect natural and cultural assets in order to ensure the sustainability of rural production and lifestyles. (710)</p> <p>-To support initiatives and collaborations that will carry information on traditional production and preservation knowledge in areas such as traditional crafts and handicrafts specific to villages, agro-tourism, geographically marked products, ornamental plants, viticulture, apiculture, fishing, poultry farming, cultivation of alternative agricultural products, agricultural products and food to future generations by ensuring that the production and lifestyles in the villages, as well as nature and cultural assets, are protected. (710.1)</p> <p>-Detection, registration, protection, sustainable use, development, monitoring, and prevention of smuggling of biodiversity and genetic resources, bringing the benefits of genetic resources and related traditional information to Turkey. (716)</p> <p>-Effective management of nature conservation areas by increasing the number of protected areas on land and sea for the protection, restoration, and sustainable use of ecosystems and ecosystem services. (717)</p>

NATIONAL STRATEGY and ACTION PLANS

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<p>National Biodiversity Strategy and Action Plan – NBSAP (2007)</p>	<p>With NBSAP, goals for 6 thematic areas, namely agricultural biodiversity, forest biodiversity, steppe biodiversity, mountain biodiversity, inland waters biodiversity, and coastal and marine biodiversity, and 4 common goals for all thematic areas have been determined. “Objective 5” in the strategy directly targets the steppe ecosystems, and the common goals include goals and actions related to steppe ecosystems.</p> <p>“To protect steppe biodiversity, to ensure the sustainable use of its components, as well as to ensure the fair and equitable sharing of the benefits from the utilization of genetic resources; and to combat against the loss of steppe biodiversity and the socio-economic results of that” (Goal 5) includes goals and actions directly related to steppe ecosystems.</p> <ul style="list-style-type: none"> -To fill the information gaps concerning steppe biodiversity (Objective 5.1) -To identify ecological, physical and social processes such as grazing, drought, desertification, aridity, salinity, flood, fires, tourism, agricultural transformation or abandonment which have adverse impacts on the biodiversity of steppe ecosystems and mainly on the ecosystem structure and function, and to take measures regarding the above (Objective 5.2) -To establish mechanisms and frameworks in order to support the fair and equitable sharing of the benefits from the utilization of the genetic resources of steppe areas (Objective 5.3)
<p>National Biodiversity Action Plan – NBAP (2008-2028)</p>	<p>Also, “To identify, protect and monitor biodiversity components which have importance for Turkey (Goal 1)”, “To use biodiversity components in a sustainable manner by applying the methods and at a level fitting to their renewal capacity by taking the future generations’ needs into account (Goal 2)” “To identify, protect and benefit the components of genetic diversity, including the traditional knowledge, which have importance for Turkey (Goal 3)” include common goals and actions for all thematic areas also associated with steppe ecosystems. “The designation of special areas in the steppe ecosystems which are especially important for biodiversity and/or are specifically under threat and establishing protection status for these areas (Strategic Action 1.2.3)” is specifically related to the steppe ecosystems.</p> <p>The strategy document offers information about, identification and classification of steppe ecosystems in Turkey, the current state of steppe</p>

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	<p>ecosystems, native animal breeds and plant species of steppes, threats to the steppes. It also emphasizes that the existing protected areas do not adequately represent the biodiversity components of Turkey, especially steppe and marine ecosystems.</p> <p>NBAP national targets do not include objectives directly related to the "steppe". However, since the NBSAP Goals and Objectives are valid during 2018-2028 and are associated with NBAP, the national objectives specified in the NBAP also support steppe ecosystems.</p> <ul style="list-style-type: none"> -Determining the pressure and threats on biodiversity and ecosystems and reducing or eliminating them as much as possible -Developing species-specific and ecosystem-based conservation approaches (traditional and modern) by determining, monitoring, assessing the biodiversity elements (ecosystem, species, and genetic diversity) -Ensuring sustainable management by preserving the biodiversity of areas exposed to agriculture, forestry, and fishing activities -Raising awareness of the public and administrators about ecosystem services, increasing the benefits arising from ecosystem services, and ensuring sustainable biodiversity management -Providing the rehabilitation and restoration of ecosystems damaged due to different reasons, developing measures to prevent damage to healthy ecosystems and eliminating legislative deficiencies in this regard -Establishing a public, university and private sector cooperation mechanism and preparing long-term plans and programs for the development of high value-added products based on knowledge and technology within the framework of conservation and sustainable use of biological resources -Preparing national legislation and establishing the necessary technical infrastructure, taking into account international conventions on access to genetic resources and the equal and fair sharing of benefits arising from their use.
<p>Ecosystem-Based Adaptation Strategy for Anatolian Steppe Ecosystems (2018)</p>	<p>It aims to facilitate and encourage "Ecosystem-Based Adaptation" strategies and practices in steppe ecosystems for adaptation to climate change. In this context, it includes 4 strategic objectives: Increasing the resilience of the affected and likely to be affected ecosystems to climate change, building a strong rural economy and a climate-resistant/resilient local society, integrating "Ecosystem-Based Adaptation" into policy, plan, and decision-making processes in a way that supports the climate change adaptation strategy,</p>

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	<p>developing a management model by improving the management capacity of stakeholders. Under these strategic objectives, there are long, medium, and short term goals and actions related to the conservation and management of steppes that support adaptation to climate change under the headings of agriculture and agriculture-related rangeland management, water management, and forestry management.</p>
<p>Turkey's National Climate Change Strategy (2010-2023)</p>	<p>The term "steppe" ("bozkır or "step", in Turkish) is not mentioned in the Climate Change Strategy, but it contains long, medium and short term targets within the scope of the "Land Use, Agriculture and Forestry" sector and "Adaptation to Climate Change" that will contribute to the conservation and sustainable management of steppe ecosystems.</p> <ul style="list-style-type: none"> - Under "Land Use, Agriculture and Forestry"; there are goals related to rational use of fertilizers, certified seed production with organic farming and drought-tolerant plant species, use of infarm modern pressurized irrigation systems, conservation, improvement and efficient use of soil and lands, and protection from soil erosion, effective implementation of Soil Preservation and Land Utilization Law and regulation of legislation, protection and improvement of meadows and rangelands, fertilization depending on soil analysis conditions, reducing urbanization pressure on rural and natural areas. - Under "Adaptation to Climate Change"; there are goals related to agricultural drought, desertification and erosion, scientific studies on the sustainable use of natural resources, sustainable management of water resources, soil cultivation, drainage, irrigation techniques, mulching measures to prevent the increase in salinity in irrigated areas, the identification, sensitivity assessment and conservation of the negative effects of climate change on sensitive ecosystems, urban biotopes and biodiversity.
<p>Turkey's National Climate Change Action Plan – NCCAP (2011-2023)</p>	<p>The Climate Change Action Plan includes purposes, objectives, and actions under 7 sectors. Among these, under the sector of "Land Use and Forestry", "Identifying the carbon sequestration potentials of the maquis and steppes lands, which spread across wide areas in Turkey (O1.1.1.3)" includes the action directly related to steppe ecosystems. It also includes related objectives and actions that will contribute to the conservation and sustainable management of steppe ecosystems under the "Agriculture" and "Land Use and Forestry" sectors.</p> <ul style="list-style-type: none"> - Under the "Agriculture" sector; the dissemination of sustainable agricultural techniques such as stubble tillage, alternation, use of organic and green

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<p>Turkey's National Climate Change Adaptation Strategy and Action Plan – NCCASAP (2011-2023)</p>	<p>fertilizers, low-tillage and no-tillage agriculture that will contribute to the conservation and sustainable management of the steppes, activating soil, crop production and rangeland management based on sustainable use of natural resources, improvement of irrigation infrastructure based on protection and effective use of water resources.</p> <p>- Under the "Land Use and Forestry" sector; consideration of biodiversity, wildlife, hydrology and carbon storage functions in rehabilitation and reclamation of in-forest rangelands.</p> <p>NCCAP and NCCASAP focus on five areas, namely Water Resources Management; Agriculture and Food Security; Ecosystem Services, Biodiversity and Forestry; Natural Disaster Risk Management; and Human Health. The goals and actions associated with integrated management of water resources, sustainable planning of agricultural water use, protection of soil and agricultural biodiversity against the effects of climate change; integrating the adaptation to climate change approach into ecosystem services, biodiversity and forestry policies; identifying and monitoring the effects of climate change on biodiversity and ecosystem services contribute to the conservation and sustainable management of steppe ecosystems.</p> <p>NCCAP and NCCASAP, focus on five areas, namely; Water Resources Management; Agriculture and Food Safety; Ecosystem Services, Biodiversity, and Forestry; Natural Disaster Risk Management; and Human Health. The objectives and actions associated with integrated management of water resources, sustainable planning of agricultural water use, protection of soil and agricultural biodiversity against the effects of climate change; integrating the climate change adaptation approaches into ecosystem services, biodiversity and forestry policies; identifying and monitoring the effects of climate change on biodiversity and ecosystem services contribute to the conservation and sustainable management of steppe ecosystems.</p> <p>The action "Conducting R&D studies to identify and monitor the effects of climate change on steppe ecosystems (indicator species, sensitive ecosystems) (UO2.6.3)" under the objective of "Identifying and monitoring the effects of climate change on the mountain, steppe, inland water, and marine ecosystems and on the ecosystem services they provide and developing measures for adaptation to climate change (OBJECTIVE UO2.6)" involves the action directly related to steppe ecosystems.</p>

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<p>National Strategy and Action Plan to Combat Desertification – NSAPCD (2015-2023)</p>	<p>NSAPCD includes outputs and actions directly related to improving steppe ecosystems, increasing management efficiency and ensuring their representation in the conservation network.</p> <ul style="list-style-type: none"> - Amelioration practices in forest, steppe, wetland, coastal zone and other natural habitats in line with natural ecosystem structure. (Output 7.4) - Improve efficiency of steppe habitat conservation management in protected steppe areas (Action 7.4.6) - Review and improve protected area definitions; ensuring the representation of different steppe types in the protected area network and making management plans in protected areas (Action 7.6.3) <p>One of the strategic goals of NSAPCD is to create synergy between the three Rio Conventions, to protect biodiversity, and to contribute to the solution of climate change through desertification/land degradation combat and sustainable land management. For this reason, it offers capacity building, coordination and cooperation, policy, science, technology, monitoring, and financing recommendations, which include many sectors such as agriculture, forestry, land use, rural development, nature conservation, and water management. Many of these recommendations include actions that contribute to the conservation and sustainable management of the steppes. In particular, under the Sustainable Land Management, climate change-oriented conservation measures and improvement practices that integrate the protection of biodiversity and ecosystem services are the basic standards.</p>
<p>National Rural Development Strategy (2014-2020)</p>	<p>The term “steppe” (“bozkır or “step”, in Turkish) is not mentioned in the Strategic Plan. Environmentally-friendly agricultural production methods, sustainable natural resource management, and climate change issues have been considered. Within the scope of “Improving the Rural Environment and Ensuring the Sustainability of Natural Resources”, one of the objectives of the Strategic Plan, the use of environmentally-friendly production methods in agricultural activities, the prevention of environmental pollution caused by animal wastes, the promotion of organic agriculture, the dissemination of good agricultural practices, ensuring efficiency in agricultural irrigation and the use of agricultural lands, protect the balance of protection and use of forest resources, to reduce the development problems arising from the disadvantageous positions of the villages established in or around the protected areas, especially forest villages, and to provide sustainable</p>

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
	livelihoods on the basis of participation, and to protect biodiversity and ecological wealth are targeted.
National Basin Management Strategy and Action Plan (2014-2023)	<p>The National Basin Management Strategy and Action Plan does not include the term “steppe” (“bozkır or “step”, in Turkish) and does not include a policy and measure directly related to steppe ecosystems. However, it is based on the sustainable management of water basins and the use of natural resources as a part of the ecosystem in the basins, within the framework of conservation and sustainability. In this context, it includes goals, objectives and strategies, including the legal regulations, programs and plans for the sustainable management and use of water resources of the basins, efficiency and saving of water use, agricultural irrigation efficiency (Objective 2); sustainable use of agricultural lands, protection, reclamation and sustainable use of meadows and rangelands, and erosion control for prevention of destruction and erosion in basin areas and natural resources, rehabilitation and sustainable use of degraded basin areas (Objective 3); sustainable management of protected and sensitive areas in basins, and inventory and monitoring studies on biodiversity and ecosystem services to protect and manage the biodiversity of the basins, natural and cultural landscape resource values and to ensure the sustainability of ecosystem services (Objective 4); large-scale integrated participatory basin rehabilitation projects to raise awareness of the people living in the basin, to increase their quality of life and welfare and to reduce the pressures on natural resources (Objective 5); the possible effects of climate change and adaptation to these impacts in basin management, and the development of adaptation and combat mechanisms (Objective 7).</p>
National Drought Management Strategy Document and Action Plan (2017-2023)	<p>The National Drought Management Strategy Document and Action Plan does not include the term “steppe” (“bozkır or “step”, in Turkish) and does not include a policy and measure directly related to steppe ecosystems. However, it includes goals and strategies such as preparing legislation on drought management based on basin-based sustainable drought management, preparation, implementation and monitoring of drought management plans for effective management of drought, establishing drought prediction and early warning systems, carrying out integrated-participatory rehabilitation and basin improvement projects, creation of drought database, informing the public about drought, determining the effects of climate change on drought and preparing adaptation strategies.</p>

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
<p>Turkey Agricultural Drought Strategy and Action Plan (2018-2022)</p>	<p>Turkey Agricultural Drought Strategy and Action Plan does not include the term “steppe” (“bozkır or “step”, in Turkish) and does not contain policies and measures directly associated with steppe ecosystems. It aims to keep the effects of drought at a minimum by taking all necessary measures for the future in periods when drought does not occur with environmentally sustainable agricultural water use planning and implementing an effective combat program during crisis periods. Measures determined in agricultural lands and rangelands contain supporting elements in terms of conservation and sustainable management of steppes within the scope of basic development axes, such as Drought Risk Estimation and Crisis Management, Ensuring Sustainable Water Supply, Effective Management of Agricultural Water Demand, Accelerating Supporting R&D Activities and Increasing Training/Publication Services and Developing Institutional Capacity.</p>
<p>National Capacity Action Plan (2011)</p>	<p>The National Capacity Action Plan includes cross-cutting issues and synergy areas for the effective implementation of three Rio Conventions (United Nations Framework Convention on Climate Change, Convention on Biological Diversity and Combat Desertification): National and Sectoral Integration; Sustainable Land Management; Level of Vulnerability to Climate Change and Adaptation; Data Collection, Monitoring, Evaluation and Reporting; Research, Development, Education/Training and Technical Cooperation; Active Participation, Awareness Raising and Training of Stakeholders. Sustainable Land Management is presented as one of the most important tools to the sustainable management and rehabilitation of land resources, especially forest, agriculture, rangeland, wetland and steppe ecosystems, the protection and development of soil and water resources, increasing the carbon holding capacity of the soil, water and vegetation and the conservation of biodiversity. For this purpose, developing a sustainable land management strategy and making legal arrangements, the realization of integrated and sustainable basin management, capacity building, and financing have been prioritized.</p>
<p>Turkey's National Protected Areas and Climate Change Strategy (2011)</p>	<p>In this strategy, establishing a "protected area system" of Turkey in the context of protected areas and climate change, establishing policies regarding the planning and management of protected areas, increasing the number of research, raising awareness, and sharing information are included as priority issues. The strategy is handled in three main groups: forest, wetland and steppe, and coastal ecosystems.</p>

INSTITUTIONAL PLANS and PROGRAMS

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
<p>Ministry of Agriculture and Forestry Strategic Plan (2019-2023)</p>	<p>The term “steppe” (“bozkır or “step”, in Turkish) is not mentioned in the Strategic Plan. The strategic plan includes objectives and targets that will contribute to the conservation and management of steppe ecosystems related to increasing welfare in rural areas, increasing productivity and quality in agricultural production (A1) sustainable management of soil and water resources (A4); combating climate change, desertification and erosion (A5); and sustainable management of biodiversity (A6).</p> <p>In this context, the following strategies and actions can be associated with steppe ecosystems: supporting organic and good agricultural practices in crop production; increasing biological and biotechnical control methods; dissemination of rangeland rehabilitation and management projects; increasing forage crop production; establishing an agricultural support model aimed at protecting the agricultural environment and natural resources; increasing environmental support and incentives (especially for women farmers) towards improvement of the quality of life in rural areas, ensuring that the rural areas are protected, livable and productive; disseminating pressure irrigation systems; making basin-based drought management plans; generalizing the national land cover monitoring system; combating desertification/land degradation and erosion projects; climate change adaptation and agricultural drought projects; erosion detection and control in agricultural lands and rangelands; legal regulation and awareness raising for recording and protecting genetic resources; establishing an effective protected area management and monitoring system, developing nature tourism and carrying out income generating activities for the local people; making survey inventory in sensitive areas and announcing new protected areas; bio-smuggling risk map modeling study; recording and making a database of traditional biodiversity-based information; training and awareness raising activities on game and hunting; making and monitoring species action plans by means of planning, production, and wild animal inventory studies in wildlife reserves, establishment of rescue and rehabilitation centers.</p>
<p>General Directorate of Forestry Strategic Plan (2019-2023)</p>	<p>The term “steppe” (“bozkır or “step”, in Turkish) is not mentioned in the Strategic Plan. Strategic Plan includes the strategic objectives of effective protection of forest and forest resources against biotic and abiotic factors (A1); forestry development, increase in their efficiency and forest expansion (A2); ensuring that the society gains optimum benefit from forestry products and services (A3); and improving institutional capacity (A5). The development and</p>

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
	<p>dissemination of erosion efforts and the rehabilitation works in rangelands in forests, forest edges and at the forest line, which are used as rangelands but cannot be transformed into forest areas, are targeted, on the one hand, to prevent soil erosion, and on the other hand to reduce the negative pressures of animal grazing on forests (Objective 2.5).</p>
<p>3rd Agriculture and Forestry Council (2019)</p>	<p>The subjects included in the 3. Agriculture and Forestry Council Conclusion Declaration were the establishment of a support system that improves the structure of the agricultural sector and protects natural resources and the environment; completion of rangeland determination and restriction studies, allocation of these to producers and producer organizations, development of plant seeds to be used in rangeland rehabilitation; disseminating Smart Agricultural Practices; conservation, development and commercialization of ancestral (local) seed varieties; sustainable management of soil and water resources; determination, protection, improvement and dissemination of native genetic resources and biodiversity in agriculture and forestry; the determination, protection, development and monitoring of natural resources and biodiversity; opening farming vocational training institutions and encouraging young people to receive training; production and use of organic and organomineral fertilizers, dissemination of biological and biotechnical control; effective and efficient management of combating desertification and erosion. These topics support the conservation and sustainable management of steppe ecosystems.</p>

ANNEX 2. First National Steppe Conservation Workshop Survey Results

NO	TITLE	GDPP			NCNP			GDL			GDF			GDARP		
		1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.
1	Conservation of important species	15	27	21	69	8	1	13	16	13	15	34	10	28	27	9
2	Conservation of plant genetic resources	41	27	9	35	20	9	2	14	30	11	35	7	46	24	2
3	Conservation of animal genetic resources	2	10	29	23	26	10	67	14	1	3	19	22	23	25	11
4	Conservation of vegetation cover	42	26	7	47	21	6	3	9	32	31	28	9	19	18	13
5	Conservation of rangelands/steppes in the forests or on forest edge	25	26	13	24	28	9	9	12	27	63	14	2	8	20	18
6	Conservation of plant species composition – Forage plant diversity	65	13	1	13	22	22	12	16	19	7	20	21	33	26	5
7	Conservation of plant species composition – Species diversity	47	21	8	37	13	11	2	12	25	18	26	13	26	28	9
8	Conservation of soil	31	24	10	16	29	13	2	9	26	52	15	8	25	18	5
9	Grazing planning	54	13	7	8	23	16	40	17	7	22	32	14	14	25	14
10	Determining the carrying capacity of rangelands	57	14	5	8	23	22	34	18	10	21	25	19	18	27	10
11	Determining the number and type of animals to graze	38	21	11	3	12	28	58	13	7	11	28	22	16	24	19
12	Allocation of rangelands (in forest regime, with important species, general)	58	11	9	8	19	24	20	18	11	31	31	12	13	20	13
13	Prevention of misuse (quarry, solar power plant, afforestation, etc.)	47	10	10	33	18	11	9	15	18	36	34	7	11	20	13
14	Research on improvement and rehabilitation of steppes or rangelands	45	25	7	22	24	14	14	21	15	21	32	16	47	16	5

NO	TITLE	GDPP			NCNP			GDL			GDF			GDARP		
		1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.
15	Implementation of the improvement and rehabilitation of steppes or rangelands	66	8	3	21	24	16	16	21	14	22	29	15	17	34	13

* In the assessment, the experts scored the responsibilities of different institutions for different titles in priority (1st priority, 2nd priority, and 3rd priority). In the table, scoring totals for all experts participating in the assessment are given.

ANNEX 3. Distribution of Data on the Area of Steppe, Area of Steppe Forest, Area of Registered Rangeland, Livestock Numbers, and Population in the Districts Within the Potential Steppe Zone

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppe (ha)	Area of steppe forest (ha)	Area of registered rangeland (ha)**	Number of cattle***	Number of sheep and goats***	Population***
1	Adana	Pozantı	17	12,840	61	3,345	1,509	25,100	20,683
2	Adana	Tufanbeyli	18	8,491	371	1,775	14,111	18,930	17,667
3	Adıyaman	Besni	32	9,644	0	2,470	11,188	92,118	77,301
4	Adıyaman	Çelikhan	4	1,589	0	540	4,606	3,945	16,065
5	Adıyaman	Gerger	5	1,645	0	0	13,045	24,582	19,035
6	Adıyaman	Kahta	65	20,093	0	3,092	26,851	39,712	122,774
7	Adıyaman	Merkez	63	23,421	488	7,226	39,406	97,220	304,615
8	Adıyaman	Samsat	100	5,932	0	2,516	1,385	5,915	7,893
9	Adıyaman	Sincik	15	6,434	476	3,369	13,073	11,761	17,414
10	Adıyaman	Tut	13	3,085	0	37	4,821	8,517	10,161
11	Afyonkarahisar	Bolvadin	38	8,573	0	4,942	34,010	81,493	43,398
12	Afyonkarahisar	Çay	72	18,261	141	768	34,799	41,741	31,412
13	Afyonkarahisar	Çobanlar	34	1,379	0	1	11,150	35,875	14,503
14	Afyonkarahisar	Dinar	41	33,110	0	18	23,411	87,218	47,304
15	Afyonkarahisar	Emirdağ	65	36,362	0	10,151	15,074	154,358	37,817
16	Afyonkarahisar	Merkez	19	12,057	539	32	68,400	99,500	299,673
17	Afyonkarahisar	Sandıklı	1	1,418	0	0	31,229	49,492	56,182
18	Afyonkarahisar	Sinanpaşa	2	1,342	9	0	40,800	38,300	41,468
19	Afyonkarahisar	Şuhut	98	63,814	702	5	34,404	68,298	36,947
20	Afyonkarahisar	Sultandağı	87	35,210	0	4,851	7,976	51,540	15,076

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppe (ha)	Area of steppe forest (ha)	Area of registered rangeland (ha)**	Number of cattle***	Number of sheep and goats***	Population***
21	Ağrı	Diyadin	100	97,234	0	941	14,986	259,622	42,123
22	Ağrı	Doğubayazıt	100	171,837	0	657	48,849	546,456	121,263
23	Ağrı	Eleşkirt	100	76,797	1,187	1,627	62,152	45,057	34,180
24	Ağrı	Hamur	100	57,066	0	334	43,226	67,281	19,115
25	Ağrı	Merkez	100	97,485	1,059	4,236	103,675	77,982	149,188
26	Ağrı	Patnos	99	53,884	0	753	36,145	201,713	122,833
27	Ağrı	Taşlıçay	100	56,303	0	1,296	24,132	69,208	20,450
28	Ağrı	Tutak	100	79,018	265	3,319	55,287	55,486	30,505
29	Aksaray	Ağaçören	100	8,642	0	2,458	6,517	28,020	8,320
30	Aksaray	Eskil	100	53,352	0	43,333	61,610	112,020	26,648
31	Aksaray	Gülağaç	100	8,652	0	492	8,621	26,439	19,903
32	Aksaray	Güzelyurt	100	9,628	173	3,805	6,342	21,873	11,761
33	Aksaray	Merkez	100	133,839	807	62,615	142,535	382,232	295,351
34	Aksaray	Ortaköy	100	22,122	0	7,356	21,802	55,704	32,504
35	Aksaray	Sarıyahşi	100	6,063	0	1,847	1,400	4,252	6,801
36	Aksaray	Sultanhanı	100	19,272	0	18,463	17,656	48,095	10,884
37	Amasya	Göynücek	2	422	286	0	18,059	13,818	10,703
38	Ankara	Akyurt	100	11,791	847	1,820	33,159	9,903	34,588
39	Ankara	Altındağ	100	2,124	120	0	13,500	2,918	370,024
40	Ankara	Ayaş	100	44,800	584	3,054	19,520	85,014	15,540
41	Ankara	Bala	100	58,115	449	7,013	28,036	136,943	33,644
42	Ankara	Beypazarı	86	67,775	20,151	343	12,392	135,895	48,274
43	Ankara	Çankaya	100	21,856	1,346	410	9,576	38,754	920,890
44	Ankara	Çubuk	100	41,762	21,317	813	60,478	43,003	89,046

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppe (ha)	Area of steppe forest (ha)	Area of registered rangeland (ha)**	Number of cattle***	Number of sheep and goats***	Population***
45	Ankara	Elmadağ	100	32,355	430	431	17,519	47,112	45,349
46	Ankara	Etimesgut	100	5,911	221	1,438	2,277	12,354	570,727
47	Ankara	Evren	100	5,115	0	87	2,730	5,327	3,606
48	Ankara	Gölbaşı	100	30,580	183	9,776	33,160	126,025	134,378
49	Ankara	Güdül	86	24,894	4,835	3,591	13,978	117,474	10,074
50	Ankara	Haymana	100	81,127	33	39,047	35,116	182,215	45,931
51	Ankara	Kahramankazan	100	14,431	3,088	1,873	17,471	26,934	53,522
52	Ankara	Kalecik	100	55,696	473	7,354	23,877	22,865	13,450
53	Ankara	Keçiören	100	5,390	486	710	3,666	5,552	909,787
54	Ankara	Kızılcahamam	36	32,409	7,437	25	25,992	38,943	32,647
55	Ankara	Mamak	100	10,575	57	12	11,472	11,310	647,252
56	Ankara	Nallıhan	25	33,221	81	1	9,287	83,904	28,091
57	Ankara	Polatlı	100	122,602	638	10,324	87,775	251,640	122,287
58	Ankara	Pursaklar	100	3,548	101	137	3,601	4,000	143,055
59	Ankara	Şereflikoçhisar	100	43,614	57	2,697	16,725	76,439	34,202
60	Ankara	Sincan	100	24,258	86	10,107	41,380	98,874	518,893
61	Ankara	Yenimahalle	100	5,527	11	1,193	2,516	8,082	663,580
62	Ardahan	Çıldır	98	63,125	2,095	41,370	39,643	29,096	9,833
63	Ardahan	Damal	100	9,237	137	3,894	18,580	140	5,802
64	Ardahan	Göle	65	52,722	440	31,876	93,325	16,750	25,187
65	Ardahan	Hanak	99	41,289	1,023	27,749	42,572	3,240	9,054
66	Ardahan	Merkez	92	68,391	3,110	42,842	95,633	24,000	42,226
67	Ardahan	Posof	5	2,716	0	1,981	17,172	1,012	6,805
68	Artvin	Ardanuç	13	12,834	42	5,505	9,483	45,458	12,056

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppe (ha)	Area of steppe forest (ha)	Area of registered rangeland (ha)**	Number of cattle***	Number of sheep and goats***	Population***
69	Artvin	Şavşat	3	4,143	0	3,523	19,264	17,026	17,606
70	Artvin	Yusufeli	4	7,174	547	2,431	14,121	11,971	20,794
71	Batman	Beşiri	100	38,050	0	7,498	6,866	190,302	30,445
72	Batman	Gercüş	100	71,527	0	751	4,514	60,708	20,484
73	Batman	Hasankeyf	100	27,979	0	1,030	1,424	17,797	6,724
74	Batman	Kozluk	60	38,722	0	318	41,080	136,203	61,437
75	Batman	Merkez	100	30,889	0	10,314	24,171	357,843	447,106
76	Batman	Sason	26	15,591	0	0	29,729	57,302	32,907
77	Bayburt	Aydıntepe	80	28,270	347	10,558	9,666	6,067	6,984
78	Bayburt	Demirözü	100	32,041	1,211	4,313	18,984	6,584	8,657
79	Bayburt	Merkez	99	173,633	11,446	59,746	69,410	36,136	66,633
80	Bingöl	Genç	3	3,314	26	0	20,493	33,591	38,428
81	Bitlis	Adilcevaz	76	12,310	0	8,949	8,264	107,465	30,376
82	Bitlis	Ahlat	14	2,451	0	667	11,964	105,651	40,806
83	Bitlis	Tatvan	46	2,857	1,077	596	10,388	97,147	92,695
84	Çankırı	Çerkeş	1	1,109	0	832	35,404	9,900	18,694
85	Çankırı	Eldivan	100	18,563	4,240	4,123	3,300	8,738	7,588
86	Çankırı	İlgaz	8	4,822	1,351	844	10,150	11,839	14,891
87	Çankırı	Kızılırmak	100	16,691	0	12,383	13,480	10,900	8,220
88	Çankırı	Korgun	100	28,616	3,964	7,157	8,912	4,007	5,666
89	Çankırı	Kurşunlu	39	19,054	2,351	8,004	12,367	7,829	10,307
90	Çankırı	Merkez	100	74,463	792	32,434	15,843	49,020	96,025
91	Çankırı	Orta	92	43,196	3,886	17,618	25,230	8,440	20,439
92	Çankırı	Şabanözü	100	24,546	3,171	6,025	12,149	5,677	14,080

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppe (ha)	Area of steppe forest (ha)	Area of registered rangeland (ha)**	Number of cattle***	Number of sheep and goats***	Population***
93	Çankırı	Yapraklı	97	33,037	14,914	4,973	5,533	6,665	8,981
94	Çorum	Alaca	100	25,850	8,040	3,391	24,429	15,398	31,460
95	Çorum	Bayat	99	28,698	8,447	4,832	13,442	12,509	16,525
96	Çorum	Boğazkale	100	5,882	7,845	227	4,507	4,427	4,175
97	Çorum	Dodurga	35	3,347	1,440	7	2,498	2,700	6,368
98	Çorum	İskilip	51	21,802	7,868	2,683	24,500	16,210	32,546
99	Çorum	Laçın	19	1,806	863	53	5,600	9,194	4,770
100	Çorum	Mecitözü	2	207	544	134	25,314	19,985	15,655
101	Çorum	Merkez	85	68,950	34,568	14,117	53,951	44,100	294,807
102	Çorum	Oğuzlar	98	4,094	1,755	135	3,574	0	5,483
103	Çorum	Ortaköy	6	190	163	82	5,352	6,206	8,696
104	Çorum	Sungurlu	100	64,082	12,401	8,062	36,487	45,410	49,082
105	Çorum	Uğurludağ	100	17,027	4,421	1,619	7,624	9,141	8,252
106	Diyarbakır	Bağlar	100	23,961	0	16,307	55,516	239,822	388,387
107	Diyarbakır	Bismil	100	17,197	0	6,807	27,419	97,160	117,674
108	Diyarbakır	Çermik	96	62,031	20	7,660	36,061	350,125	50,812
109	Diyarbakır	Çınar	100	115,448	1	22,327	58,054	372,756	74,207
110	Diyarbakır	Çüngüş	62	27,410	259	4,691	4,035	10,100	11,927
111	Diyarbakır	Dicle	100	56,119	1,466	1,044	22,067	30,560	38,220
112	Diyarbakır	Eğil	100	33,134	0	6,919	16,052	60,527	23,369
113	Diyarbakır	Ergani	100	90,047	15	31,301	57,940	259,172	130,105
114	Diyarbakır	Hani	94	30,701	290	657	17,203	24,642	33,100
115	Diyarbakır	Hazro	100	21,811	1,012	1,884	20,391	13,405	16,935
116	Diyarbakır	Kayapınar	100	21,609	0	10,427	27,025	128,885	362,407

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppe (ha)	Area of steppe forest (ha)	Area of registered rangeland (ha)**	Number of cattle***	Number of sheep and goats***	Population***
117	Diyarbakır	Kocaköy	100	9,840	195	151	18,732	12,578	16,679
118	Diyarbakır	Kulp	43	55,854	924	75	56,030	55,000	36,640
119	Diyarbakır	Lice	64	40,759	2,836	288	45,201	48,918	26,163
120	Diyarbakır	Silvan	100	40,786	710	2,780	75,283	62,157	86,672
121	Diyarbakır	Sur	100	12,444	0	3,166	31,333	26,451	112,306
122	Diyarbakır	Yenişehir	100	8,536	0	4,185	21,120	42,381	206,793
123	Elazığ	Ağın	100	13,671	0	1	796	10,622	2,776
124	Elazığ	Alacakaya	73	20,063	52	0	3,338	8,068	6,566
125	Elazığ	Arıcak	53	14,369	924	0	10,238	10,389	17,028
126	Elazığ	Baskil	100	93,685	287	9,102	5,617	9,078	20,505
127	Elazığ	Karakoçan	11	4,934	0	0	35,662	60,856	28,702
128	Elazığ	Keban	100	51,530	40	16,364	1,990	20,952	8,409
129	Elazığ	Kovancılar	76	46,330	9	974	38,845	166,143	38,774
130	Elazığ	Maden	100	68,677	750	382	5,365	8,927	16,608
131	Elazığ	Merkez	100	106,277	857	34,346	69,671	343,520	421,726
132	Elazığ	Palu	34	15,734	315	15	9,450	28,700	23,834
133	Elazığ	Sivrice	100	55,395	208	7,118	6,446	31,490	10,710
134	Erzincan	Çayırlı	65	44,525	769	19,362	12,066	29,025	9,032
135	Erzincan	İliç	97	121,219	4,036	46,014	1,870	46,475	8,922
136	Erzincan	Kemah	69	141,070	4,695	61,485	2,577	57,754	8,167
137	Erzincan	Kemaliye	73	83,313	173	25,224	1,529	36,623	5,555
138	Erzincan	Merkez	71	65,569	1,173	21,384	42,044	107,983	157,452
139	Erzincan	Otlukbeli	100	25,753	818	10,884	5,705	5,043	2,437
140	Erzincan	Refahiye	42	53,063	8,121	15,395	11,288	6,883	12,456

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141	Erzincan	Tercan	61	52,327	1,531	16,011	28,851	101,353	17,623
142	Erzincan	Üzümlü	20	5,102	51	1,994	8,985	43,318	14,390
143	Erzurum	Aşkale	80	67,475	5,749	28,438	34,093	16,005	23,589
144	Erzurum	Aziziye	74	60,959	1,620	17,685	47,258	11,669	62,289
145	Erzurum	Hınıs	57	41,341	1,212	16,162	41,858	98,059	26,865
146	Erzurum	Horasan	100	83,750	1,935	38,521	64,567	27,736	39,445
147	Erzurum	İspir	31	63,313	1,282	46,546	21,900	11,034	15,898
148	Erzurum	Karaçoban	88	23,124	0	13,685	40,806	58,690	23,246
149	Erzurum	Karayazı	100	147,527	1,785	51,593	62,700	76,402	28,502
150	Erzurum	Köprüköy	100	34,713	2,319	13,293	43,168	22,703	16,178
151	Erzurum	Narman	100	52,328	3,317	26,220	36,315	4,207	13,381
152	Erzurum	Oltu	28	34,829	435	11,878	23,481	22,003	30,966
153	Erzurum	Olur	39	30,363	652	19,548	15,484	9,336	6,715
154	Erzurum	Palandöken	44	18,174	544	5,231	22,881	10,366	168,651
155	Erzurum	Pasinler	92	53,576	5,364	23,756	65,367	46,912	28,961
156	Erzurum	Pazaryolu	95	53,983	943	36,834	4,911	6,065	4,501
157	Erzurum	Şenkaya	29	33,590	671	17,612	54,610	40,302	18,281
158	Erzurum	Tekman	60	91,710	217	44,835	62,428	172,999	25,969
159	Erzurum	Tortum	69	86,936	2,226	56,948	35,555	17,246	17,054
160	Erzurum	Uzundere	14	5,787	76	1,838	2,656	14,114	8,744
161	Erzurum	Yakutiye	100	60,018	288	38,804	42,046	18,608	191,224
162	Eskişehir	Alpu	53	15,318	0	10,812	23,274	64,231	11,242
163	Eskişehir	Beylikova	94	35,198	0	24,445	8,658	39,826	6,953
164	Eskişehir	Çifteler	89	10,411	0	3,179	6,838	67,195	15,098

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165	Eskişehir	Günyüzü	100	47,014	49	22,476	2,136	47,027	6,127
166	Eskişehir	Mahmudiye	100	13,146	0	9,811	11,873	37,142	7,998
167	Eskişehir	Mihalıççık	40	47,003	1,551	10,890	7,839	81,626	8,526
168	Eskişehir	Odunpazarı	58	23,460	762	9,748	24,359	55,384	404,267
169	Eskişehir	Seyitgazi	16	4,092	0	681	16,560	72,927	13,405
170	Eskişehir	Sivrihisar	100	120,011	947	41,648	11,484	198,917	20,746
171	Eskişehir	Tepebaşı	29	4,553	34	2,339	31,573	84,114	359,303
172	Gaziantep	Araban	61	10,542	0	2,597	8,779	60,001	32,846
173	Gaziantep	Karkamış	100	1,292	0	441	3,919	5,232	10,436
174	Gaziantep	Nizip	62	10,499	0	2,017	70,429	18,032	142,389
175	Gaziantep	Oğuzeli	71	2,870	0	1,074	58,419	77,647	32,653
176	Gaziantep	Şahinbey	10	2,436	0	1,491	33,467	82,435	906,043
177	Gaziantep	Yavuzeli	30	6,223	0	2,171	13,035	67,548	22,192
178	Giresun	Alucra	4	2,229	752	584	6,353	5,725	12,250
179	Giresun	Çamoluk	100	25,037	6,233	2,123	2,895	2,413	9,759
180	Giresun	Şebinkarahisar	7	6,717	139	2,001	27,515	26,856	21,814
181	Gümüşhane	Kelkit	96	86,985	18,567	13,923	33,450	10,849	47,891
182	Gümüşhane	Köse	97	15,504	3,166	3,494	6,738	1,560	9,387
183	Gümüşhane	Merkez	4	5,114	1,218	756	8,650	10,631	57,269
184	Gümüşhane	Şiran	95	43,235	20,192	4,236	16,861	9,120	20,084
185	Hakkari	Merkez	4	7,138	0	1,772	4,568	186,356	81,424
186	Hakkari	Yüksekova	67	144,016	0	61,438	28,113	361,834	119,760
187	İğdır	Aralık	99	66,286	0	9,703	25,207	189,384	21,311
188	İğdır	Karakoyunlu	99	10,957	0	5,631	20,122	110,046	13,972

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189	Iğdır	Merkez	100	90,915	0	34,630	64,834	547,422	137,613
190	Iğdır	Tuzluca	100	96,121	84	32,379	40,470	181,470	24,560
191	Isparta	Uluborlu	1	248	0	0	1,827	15,013	6,388
192	Kahramanmaraş	Afşin	96	87,078	436	22,345	33,302	61,000	81,423
193	Kahramanmaraş	Ekinözü	32	13,282	143	4,601	7,740	11,936	11,839
194	Kahramanmaraş	Elbistan	100	137,438	0	85,814	38,527	69,700	142,548
195	Kahramanmaraş	Göksun	8	12,653	0	3,155	19,518	62,185	55,985
196	Kahramanmaraş	Nurhak	26	24,178	0	14,880	2,330	32,229	12,592
197	Kahramanmaraş	Pazarcık	1	916	0	500	12,005	197,313	68,838
198	Karaman	Ayrancı	99	175,566	0	84,068	7,864	243,211	8,338
199	Karaman	Kazımkarabekir	100	13,809	14	1,725	3,897	20,538	4,407
200	Karaman	Merkez	82	182,594	613	62,695	45,218	329,109	194,018
201	Kars	Akyaka	99	13,330	0	2,886	35,060	13,000	10,985
202	Kars	Arpaçay	100	63,039	0	9,954	57,000	61,500	17,373
203	Kars	Digor	100	60,145	0	3,156	48,000	80,000	22,282
204	Kars	Kağızman	100	136,946	3,087	3,063	45,000	159,000	45,936
205	Kars	Merkez	100	85,745	0	15,651	110,030	70,000	115,891
206	Kars	Sarıkamış	66	74,434	1,689	10,408	61,001	35,000	42,683
207	Kars	Selim	95	43,147	0	8,587	59,010	25,000	23,231
208	Kars	Susuz	100	28,419	219	4,965	35,000	13,000	10,497
209	Kayseri	Akkışla	100	22,899	54	17,484	7,904	83,660	6,429
210	Kayseri	Bünyan	100	49,271	12	36,214	34,532	45,463	31,497
211	Kayseri	Develi	75	62,800	2,907	26,024	51,348	63,850	65,322
212	Kayseri	Felahiye	100	19,551	23	6,071	4,584	15,010	6,602

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213	Kayseri	Hacılar	100	12,165	362	2,472	5,729	8,310	12,426
214	Kayseri	İncesu	100	58,362	391	17,383	20,196	47,814	26,353
215	Kayseri	Kocasinan	100	53,728	0	11,180	61,345	59,400	391,661
216	Kayseri	Melikgazi	100	27,480	518	6,709	26,183	15,490	555,671
217	Kayseri	Özvatan	100	17,120	6	6,961	2,063	7,490	5,413
218	Kayseri	Pınarbaşı	100	198,320	235	65,577	32,047	111,506	26,911
219	Kayseri	Sarıoğlan	100	22,468	46	13,270	16,818	13,827	16,938
220	Kayseri	Sarız	94	92,580	845	50,469	16,475	16,872	10,098
221	Kayseri	Talas	100	12,804	88	5,394	12,846	18,343	157,695
222	Kayseri	Tomarza	100	79,794	1,289	38,519	26,138	27,944	22,808
223	Kayseri	Yahyalı	22	20,751	156	8,402	20,762	72,161	36,331
224	Kayseri	Yeşilhisar	100	48,890	0	29,886	10,726	39,953	17,525
225	Kilis	Elbeyli	100	2,803	0	713	1,664	19,602	6,526
226	Kilis	Merkez	50	4,330	0	1,337	7,034	90,330	116,034
227	Kilis	Polateli	2	118	0	72	1,931	51,787	5,361
228	Kırıkkale	Bahşili	100	13,337	1,235	557	1,272	5,246	7,907
229	Kırıkkale	Balışeyh	100	13,883	1,628	1,700	9,415	13,145	7,221
230	Kırıkkale	Çelebi	100	7,334	0	3,540	2,715	7,695	3,024
231	Kırıkkale	Delice	100	32,981	2,007	7,078	7,053	20,996	10,017
232	Kırıkkale	Karakeçili	100	1,960	0	499	3,758	5,954	3,810
233	Kırıkkale	Keskin	100	45,269	664	19,615	28,079	32,876	18,139
234	Kırıkkale	Merkez	100	20,570	261	2,114	11,676	17,638	196,645
235	Kırıkkale	Sulakyurt	100	35,494	3,170	4,194	4,413	17,800	8,531
236	Kırıkkale	Yahşihan	100	24,350	1	2,366	4,835	13,752	31,308

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237	Kırşehir	Akçakent	100	15,821	3,997	1,001	8,805	11,380	4,229
238	Kırşehir	Akpınar	100	24,445	0	4,576	9,819	18,548	7,826
239	Kırşehir	Boztepe	100	17,738	0	4,923	35,310	15,970	5,581
240	Kırşehir	Çiçekdağı	100	34,281	2,344	6,336	21,080	46,383	14,735
241	Kırşehir	Kaman	100	40,487	198	16,760	25,111	52,200	37,223
242	Kırşehir	Merkez	100	71,594	20	28,276	99,595	102,217	153,511
243	Kırşehir	Mucur	100	30,533	0	7,652	23,425	30,472	18,763
244	Konya	Ahırlı	40	5,541	721	34	7,405	20,000	5,084
245	Konya	Akören	100	41,240	2,654	2,159	6,791	23,333	5,879
246	Konya	Akşehir	64	5,169	26	2,564	34,605	31,150	93,233
247	Konya	Altınekin	100	39,032	0	28,152	13,512	63,361	14,548
248	Konya	Beyşehir	39	35,629	3,314	1,828	34,510	33,300	73,768
249	Konya	Bozkır	35	22,932	2,437	0	11,605	30,600	26,287
250	Konya	Çeltik	100	11,405	0	5,245	3,179	32,408	10,071
251	Konya	Cihanbeyli	100	92,939	0	45,561	42,430	165,675	52,525
252	Konya	Çumra	100	59,449	622	23,726	90,876	147,806	66,794
253	Konya	Derbent	100	17,397	4,938	1,549	4,761	5,346	4,455
254	Konya	Doğanhisar	42	915	784	0	9,373	9,051	16,029
255	Konya	Emirgazi	100	28,893	9	13,534	30,054	85,803	8,949
256	Konya	Ereğli	100	104,135	0	53,776	169,501	189,071	145,389
257	Konya	Güneysinır	87	27,944	605	1,251	8,050	25,377	9,458
258	Konya	Halkapınar	99	53,081	514	21,504	6,849	18,082	4,354
259	Konya	İlgın	97	59,725	10,511	13,992	40,045	91,319	54,622
260	Konya	Kadınhanı	100	44,040	1,187	24,478	34,531	110,300	33,036

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261	Konya	Karapınar	100	141,265	120	121,625	75,632	318,279	49,766
262	Konya	Karatay	100	101,362	0	76,669	79,479	183,800	323,659
263	Konya	Kulu	100	44,399	0	11,295	22,998	116,998	50,667
264	Konya	Meram	100	111,537	8,728	12,392	82,175	139,757	342,315
265	Konya	Sarayönü	100	49,478	1,053	30,395	28,800	89,060	26,875
266	Konya	Selçuklu	100	104,545	856	30,916	13,348	101,530	648,850
267	Konya	Seydişehir	74	58,196	10,655	3,861	31,491	54,189	64,687
268	Konya	Tuzlukçu	100	22,139	0	5,468	10,252	24,888	7,280
269	Konya	Yalıhüyük	96	456	0	0	660	650	1,785
270	Konya	Yunak	100	70,179	0	19,932	14,402	65,997	23,093
271	Malatya	Akçadağ	100	71,469	911	24,851	18,137	24,687	35,359
272	Malatya	Arapgir	100	80,604	3,293	7,542	5,391	59,329	10,868
273	Malatya	Arguvan	100	69,590	2,124	17,960	8,270	44,989	8,157
274	Malatya	Battalgazi	100	58,452	1,168	6,849	44,318	18,390	295,821
275	Malatya	Darende	100	112,711	0	10,670	7,586	33,605	29,045
276	Malatya	Doğanşehir	39	36,100	1,050	7,333	10,985	39,850	39,454
277	Malatya	Doğanyol	66	7,212	398	2,104	3,406	557	4,420
278	Malatya	Hekimhan	100	118,058	516	9,714	8,163	18,935	22,867
279	Malatya	Kale	100	14,886	472	4,698	2,378	48	6,100
280	Malatya	Kuluncak	100	47,489	183	10,519	4,763	17,145	8,384
281	Malatya	Pütürge	58	48,890	5,905	9,189	9,824	5,666	15,049
282	Malatya	Yazıhan	100	27,720	28	5,604	17,180	25,560	16,673
283	Malatya	Yeşilyurt	88	48,219	226	16,567	33,920	49,672	304,839
284	Mardin	Artuklu	100	50,265	0	11,433	6,192	107,873	174,731

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285	Mardin	Dargeçit	100	46,904	0	173	7,789	46,959	28,555
286	Mardin	Derik	100	72,858	0	19,492	56,600	317,065	61,830
287	Mardin	Kızıltepe	100	18,404	0	4,735	8,603	77,147	252,656
288	Mardin	Mazıdağı	100	63,831	8	969	8,114	132,422	35,757
289	Mardin	Midyat	100	95,047	0	1,453	12,726	66,572	113,367
290	Mardin	Nusaybin	100	73,729	0	405	6,958	81,981	105,856
291	Mardin	Ömerli	100	34,750	1	0	2,363	27,244	14,233
292	Mardin	Savur	100	78,397	0	499	6,273	78,949	27,304
293	Mardin	Yeşilli	100	12,638	1	577	1,207	39,270	14,906
294	Mersin	Çamlıyayla	3	1,770	0	0	2,000	49,301	8,679
295	Mersin	Erdemli	10	23,189	0	6,243	7,360	225,000	140,331
296	Mersin	Mut	3	7,706	0	560	20,100	181,238	62,853
297	Mersin	Silifke	3	7,467	0	1,129	11,476	163,215	119,303
298	Muş	Bulanık	32	12,399	0	1,323	103,445	143,186	80,540
299	Muş	Malazgirt	92	50,804	9	1,581	64,892	41,394	51,323
300	Nevşehir	Acıgöl	100	15,891	0	3,734	10,319	8,500	19,561
301	Nevşehir	Avanos	100	37,531	0	13,087	16,811	24,233	32,618
302	Nevşehir	Derinkuyu	100	14,230	0	7,125	14,043	13,389	20,786
303	Nevşehir	Gülşehir	100	31,517	344	14,226	13,296	41,378	21,771
304	Nevşehir	Hacıbektaş	100	18,147	211	10,217	9,258	16,105	11,487
305	Nevşehir	Kozaklı	100	20,989	0	10,758	9,553	14,066	13,570
306	Nevşehir	Merkez	100	15,474	1	3,789	11,019	16,500	143,194
307	Nevşehir	Ürgüp	100	30,568	0	7,630	6,384	11,799	35,352
308	Niğde	Altunhisar	100	36,613	78	5,973	9,088	51,040	15,463

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309	Niğde	Bor	100	92,496	0	32,927	43,186	121,031	60,335
310	Niğde	Çamardı	85	80,445	124	23,185	5,517	65,826	13,200
311	Niğde	Çiftlik	100	26,832	1,105	7,715	14,200	48,678	28,168
312	Niğde	Merkez	100	108,168	344	48,722	94,316	207,507	224,289
313	Niğde	Ulukışla	66	64,521	286	4,488	6,170	78,887	23,252
314	Rize	İkizdere	3	2,238	0	847	3,061	2,179	9,809
315	Şanlıurfa	Akçakale	99	23,638	0	10,847	20,130	80,970	113,194
316	Şanlıurfa	Birecik	100	20,037	0	928	14,473	41,093	95,149
317	Şanlıurfa	Bozova	100	44,760	704	9,284	13,725	31,281	58,565
318	Şanlıurfa	Ceylanpınar	100	50,368	0	6,556	19,775	209,955	87,684
319	Şanlıurfa	Eyyübiye	100	95,249	0	22,677	28,776	118,955	379,123
320	Şanlıurfa	Halfeti	100	31,187	0	560	12,330	31,120	41,142
321	Şanlıurfa	Haliliye	100	95,659	418	47,557	31,978	152,402	376,251
322	Şanlıurfa	Harran	100	23,931	0	7,476	6,865	46,427	87,843
323	Şanlıurfa	Hilvan	100	32,177	0	15,163	14,193	111,149	42,829
324	Şanlıurfa	Karaköprü	100	37,697	439	17,752	8,561	45,927	195,552
325	Şanlıurfa	Siverek	100	193,449	147	66,482	89,696	806,130	258,265
326	Şanlıurfa	Suruç	100	11,024	0	5,308	8,324	19,475	104,302
327	Şanlıurfa	Viranşehir	100	98,294	0	60,806	83,258	453,780	195,910
328	Siirt	Baykan	33	15,933	1	314	7,346	109,045	26,160
329	Siirt	Eruh	14	12,509	16	173	3,000	117,118	20,513
330	Siirt	Kurtalan	100	41,400	0	12,803	5,835	118,000	59,647
331	Siirt	Merkez	47	22,357	7	2,529	4,386	528,723	166,332
332	Şırnak	Cizre	76	18,956	0	2,949	15,411	200,291	143,124

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333	Şırnak	Güçlükonak	56	23,339	0	0	2,051	111,100	13,091
334	Şırnak	İdil	100	77,914	0	7,933	32,216	325,340	76,523
335	Sivas	Akıncılar	28	7,158	717	1,423	4,530	1,387	5,675
336	Sivas	Altınyayla	100	32,202	0	17,636	12,366	39,424	9,309
337	Sivas	Divriği	100	228,720	2,733	40,441	9,973	47,018	16,377
338	Sivas	Gemerek	92	59,281	666	25,451	22,135	45,137	24,828
339	Sivas	Gölova	88	14,000	988	3,645	5,333	2,843	4,176
340	Sivas	Gürün	100	218,063	19	137,857	17,100	109,000	19,076
341	Sivas	Hafik	79	89,894	2,219	36,087	17,894	14,630	10,062
342	Sivas	İmranlı	93	96,546	7,449	36,145	8,319	3,128	8,249
343	Sivas	Kangal	100	203,604	420	132,541	17,170	67,259	21,669
344	Sivas	Koyulhisar	1	938	0	511	11,602	8,481	14,613
345	Sivas	Merkez	96	196,733	1,915	90,678	78,057	59,959	377,561
346	Sivas	Şarkışla	94	99,053	919	35,526	39,458	46,941	38,954
347	Sivas	Suşehri	23	13,619	3,274	7,391	19,495	16,833	25,654
348	Sivas	Ulaş	100	57,976	459	25,078	13,047	47,988	9,682
349	Sivas	Yıldızeli	57	71,925	3,220	28,604	50,936	59,639	33,986
350	Sivas	Zara	83	151,004	11,965	52,831	26,684	8,769	23,336
351	Tokat	Artova	63	11,259	2,645	1,595	13,206	10,700	8,744
352	Tokat	Merkez	9	7,247	281	2,432	59,627	79,500	201,294
353	Tokat	Sulusaray	91	9,134	1,640	974	11,052	7,112	7,401
354	Tokat	Yeşilyurt	36	2,337	541	88	13,969	7,783	9,154
355	Tokat	Zile	41	19,421	6,048	3,527	47,223	43,435	55,673
356	Tunceli	Çemişgezek	43	11,296	0	904	4,173	125,412	8,347

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppe (ha)	Area of steppe forest (ha)	Area of registered rangeland (ha)**	Number of cattle***	Number of sheep and goats***	Population***
357	Tunceli	Mazgirt	23	9,313	0	210	6,409	43,256	8,430
358	Tunceli	Pertek	38	23,531	0	2,625	5,503	128,639	11,669
359	Van	Başkale	98	231,868	0	174,307	13,240	313,635	52,544
360	Van	Çaldıran	100	121,008	0	73,876	6,563	224,007	63,013
361	Van	Çatak	25	46,675	129	32,084	2,004	134,394	20,937
362	Van	Edremit	100	19,975	0	17,526	11,024	88,962	125,884
363	Van	Erciş	100	137,926	0	106,526	37,960	317,020	173,313
364	Van	Gevaş	52	8,499	185	5,877	9,100	82,120	28,620
365	Van	Gürpınar	99	363,768	0	290,656	8,721	643,595	35,663
366	Van	İpekyolu	100	64,507	0	57,681	18,000	154,101	312,244
367	Van	Muradiye	100	71,299	0	58,176	21,752	169,784	49,688
368	Van	Özalp	100	102,270	0	95,073	8,903	236,645	65,785
369	Van	Saray	100	72,575	0	66,108	3,074	165,950	20,949
370	Van	Tuşba	100	60,215	0	49,041	33,000	80,026	160,522
371	Yozgat	Akdağmadeni	50	41,122	13,324	1,341	36,051	40,863	42,919
372	Yozgat	Aydıncık	89	7,537	7,901	299	8,341	6,762	10,407
373	Yozgat	Boğazlıyan	100	28,915	0	5,221	14,406	66,174	34,121
374	Yozgat	Çandır	100	5,394	0	542	2,081	6,151	4,597
375	Yozgat	Çayıralan	44	15,812	4,496	1,404	7,445	13,238	13,512
376	Yozgat	Çekerek	100	34,053	16,107	227	25,943	17,953	19,786
377	Yozgat	Kadıışehri	96	16,680	4,553	1,046	19,199	9,365	11,716
378	Yozgat	Merkez	100	79,758	7,023	39,793	35,506	52,000	105,167
379	Yozgat	Saraykent	100	10,663	6,285	419	9,462	2,654	14,198
380	Yozgat	Sarıkaya	99	18,602	2,494	4,501	23,778	23,911	33,010

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppe (ha)	Area of steppe forest (ha)	Area of registered rangeland (ha)**	Number of cattle***	Number of sheep and goats***	Population***
381	Yozgat	Şefaati	100	15,291	1	10,494	9,301	25,010	15,135
382	Yozgat	Sorgun	100	36,192	9,286	2,830	32,895	35,217	79,314
383	Yozgat	Yenifakılı	100	11,485	0	854	3,611	20,000	5,538
384	Yozgat	Yerköy	100	42,897	2,161	5,494	19,790	59,500	35,561

* The provinces where the overlap of the area of the district with the potential steppe zone is <50% are marked in gray. The provinces where the overlap is lower than 1% are not shown.

** The area of the registered rangelands within the potential steppe zone in the province is given. Registered rangeland data is up to date as of April 2020.

*** TURKSTAT 2018 data were used for population and animal statistics.

ANNEX 4. Experts That Supported the Strategic Efforts

no	Name of the Participant	Name of the Institution / Unit	Province
1	Selami Işık	Governorship of Şanlıurfa Deputy Governor	Şanlıurfa
2	Mustafa Bulut	General Directorate of Nature Conservation and National Parks Deputy Director General	Ankara
3	Suat Yılmaz	General Directorate of Plant Production Deputy Director General	Ankara
4	Ahmet Dallı	General Directorate of Plant Production Deputy Director General	Ankara
5	Mehmet Çelik	General Directorate of Forestry Deputy Director General	Ankara
6	İsrafil Erdoğan	Ministry of Forestry and Water Affairs 3 rd Regional Director	Şanlıurfa
7	Murat Akgün	Ministry of Forestry and Water Affairs 3 rd Regional Deputy Director	Şanlıurfa
8	Adil Uztemur	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
9	Ahmet İlker Eken	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
10	Ahmet Ziya Evren	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
11	Asiye Şahbaz	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
12	Burak Aynur	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
13	Fecir Örnek	Şanlıurfa Provincial Branch	Şanlıurfa
14	Ecrin Kapucu	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
15	Fatime Şelale	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
16	Gülcihan Karaca Aynur	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
17	Halil Haspolat	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
18	Mehmet Ekinci	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa

no	Name of the Participant	Name of the Institution / Unit	Province
19	Mehmet Emin Saygan	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
20	Mehmet Gürkaynak	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
21	Reşat Ektiren	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
22	Sait Ceylan	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
23	Samed Aksungur	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
24	Soner Gelici	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
25	Suat Tekin	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
26	Ziya Atcı	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
27	Ziya Aygün	3 rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
28	Ömür Aybike Yıldırım	Locally based Project Assistant - FAO Şanlıurfa Office	Şanlıurfa
29	Adnan Yetkin	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
30	Aziz Aktacir	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
31	Murat Çakmak	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
32	Fatma Akgün	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
33	Fevzi Seymen	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
34	Halil Harem	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
35	Halil Nimetoğlu	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa

no	Name of the Participant	Name of the Institution / Unit	Province
36	Halil Şıtlı	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
37	Mehmet Gözoğlu	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
38	Mehmet Tanrıverdi	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
39	Mehmet Sait Yıldız	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
40	Melda Akil	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
41	Ramazan Bozdağ	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
42	Süleyman Şeker	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
43	Süleyman Tüzün	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
44	Sabri Tutuş	Şanlıurfa Provincial Directorate of Agriculture and Forestry Halfeti District Directorate of Agriculture and Forestry	Şanlıurfa
45	Sıraç Yolcu	Şanlıurfa Provincial Directorate of Agriculture and Forestry Halfeti District Directorate of Agriculture and Forestry	Şanlıurfa
46	Murat Yahlızade	Şanlıurfa Provincial Directorate of Agriculture and Forestry Suruç District Directorate of Agriculture and Forestry	Şanlıurfa
47	M. Akan Akmeşe	Şanlıurfa Provincial Directorate of Agriculture and Forestry Viranşehir District Directorate of Agriculture and Forestry	Şanlıurfa
48	Sezer Mecu	Şanlıurfa Provincial Directorate of Agriculture and Forestry Viranşehir District Directorate of Agriculture and Forestry	Şanlıurfa
49	Cevdet Çiçek	Şanlıurfa Regional Directorate of Forestry	Şanlıurfa
50	Mehmet Taşan	Şanlıurfa Regional Directorate of Forestry	Şanlıurfa
51	Murat Tuncer	Şanlıurfa Regional Directorate of Forestry	Şanlıurfa
52	Şevket Tepe	Şanlıurfa Regional Directorate of Forestry	Şanlıurfa

no	Name of the Participant	Name of the Institution / Unit	Province
53	Mehmet Yavuz	GAP Administration	Şanlıurfa
54	Neslihan Aktaş	GAP Administration	Şanlıurfa
55	Ali İlkhan	GAP Agricultural Research Institute	Şanlıurfa
56	Halil Hatipoğlu	GAP Agricultural Research Institute	Şanlıurfa
57	İbrahim Halil Çetiner	GAP Agricultural Research Institute	Şanlıurfa
58	Murat Tarini	GAP Agricultural Research Institute	Şanlıurfa
59	Adem Ekinci	Şanlıurfa Provincial Directorate of Ministry of Environment and Urbanism	Şanlıurfa
60	Ayşe Kader Polat	Şanlıurfa Provincial Directorate of Ministry of Environment and Urbanism	Şanlıurfa
61	Mehmet Kasım Ermiş	Şanlıurfa Provincial Gendarmerie Command	Şanlıurfa
62	Aydın Aslan	Şanlıurfa Provincial Directorate of Culture and Tourism	Şanlıurfa
63	Aykut Hakan Kutluhan	Şanlıurfa Provincial Directorate of Culture and Tourism	Şanlıurfa
64	İ. Etem Kapıcı	Şanlıurfa Provincial Directorate of Culture and Tourism Department of Cultural and Natural Property	Şanlıurfa
65	İsmail Uğur Hatipoğlu	Şanlıurfa Provincial Directorate of National Education	Şanlıurfa
66	Faik Yüksekayla	Şanlıurfa Metropolitan Municipality - Survey and Projects Department	Şanlıurfa
67	Sümeyye Kırıkçı	Şanlıurfa Metropolitan Municipality – Survey and Projects Department	Şanlıurfa
68	Fatma Abak	Şanlıurfa Metropolitan Municipality - Women and Family Department	Şanlıurfa
69	Leyla Duşak	Şanlıurfa Metropolitan Municipality – Women and Family Department	Şanlıurfa
70	Gülçin Baytur	Şanlıurfa Metropolitan Municipality - Parks Gardens Department	Şanlıurfa

no	Name of the Participant	Name of the Institution / Unit	Province
71	Kudret Rat	Şanlıurfa Metropolitan Municipality - Parks Gardens Department	Şanlıurfa
72	Mehmet Işık	Şanlıurfa Metropolitan Municipality - Parks Gardens Department	Şanlıurfa
73	Özlem Kendirci	Şanlıurfa Metropolitan Municipality - Parks Gardens Department	Şanlıurfa
74	Sevda Samak	Şanlıurfa Metropolitan Municipality - Parks Gardens Department	Şanlıurfa
75	Bekir Yavuz		Şanlıurfa
76	Ali Volkan Bilgili	Harran University	Şanlıurfa
77	Mahmut Kaya	Harran University	Şanlıurfa
78	Emrah Ramazanoğlu	Harran University	Şanlıurfa
79	İrfan Özberk	Harran University	Şanlıurfa
80	Mehmet Ali Çullu	Harran University	Şanlıurfa
81	Romedi Çelik	Harran University	Şanlıurfa
82	Şükrü Gürler	Harran University	Şanlıurfa
83	Ali Rıza Öztürkmen	Harran University Independent Experts Group	Şanlıurfa
84	Ömer Faruk Kaya	Harran University Independent Experts Group	Şanlıurfa
85	Tahir Polat	Harran University Independent Experts Group	Şanlıurfa
86	Büşra Bayık	ÇEVKO Foundation	Şanlıurfa
87	Hatice Akgül	ÇEVKO Foundation	Şanlıurfa
88	Hasan Eyyüpoğlu	Sheep and Goat Breeders' Association	Şanlıurfa
89	Abdullah Açıkgöz	Şanlıurfa Chamber of Veterinarians	Şanlıurfa
90	Nadiye Şihanlioğlu	Şanlıurfa Chamber of Veterinarians	Şanlıurfa
91	Mustafa Kandırmış	7 th Regional Directorate	Adana
92	Aydın Cesur	Adana Provincial Directorate of Agriculture and Forestry	Adana
93	İsmail Kozan	3 rd Regional Directorate Adıyaman Branch Office	Adıyaman
94	Şahin Çılgin	5 th Regional Directorate	Afyon
95	Koray Sunamak	9 th Regional Directorate	Ankara
96	Zafer Çelik	Ankara Provincial Directorate of Agriculture and Forestry	Ankara

no	Name of the Participant	Name of the Institution / Unit	Province
97	Yüsra Gül Tozoğlu Koçoğlu	Ministry General Directorate of the European Union and Foreign Relations	Ankara
98	Tuncay Gürsoy Yüce	General Directorate of Plant Production Department Head	Ankara
99	Kürşat Kağan Yeşil	General Directorate of Plant Production	Ankara
100	Davut Özgür	General Directorate of Plant Production National Project Implementation Unit	Ankara
101	Esra Esina	General Directorate of Plant Production Project Focal Point	Ankara
102	Gültekin Öçalan	General Directorate of Plant Production National Project Implementation Unit	Ankara
103	Tuğba Usta	General Directorate of Nature Conservation and National Parks Group Supervisor - Project Focal Point	Ankara
104	Abdulsamet Haçat	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
105	Burak Tatar	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
106	Fatih Köylüoğlu	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
107	Ömer Faruk Aslan	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
108	Serhat Erbaş	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
109	Ümit Bolat	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
110	Aysun Özkan	General Directorate of Nature Conservation and National Parks	Ankara

no	Name of the Participant	Name of the Institution / Unit	Province
111	Cihad Öztürk	General Directorate of Nature Conservation and National Parks	Ankara
112	Erdoğan Ertürk	General Directorate of Nature Conservation and National Parks	Ankara
113	Erol Kuru	General Directorate of Nature Conservation and National Parks	Ankara
114	Gencay Serter	General Directorate of Nature Conservation and National Parks	Ankara
115	Gökhan Yıldırım	General Directorate of Nature Conservation and National Parks	Ankara
116	Hüseyin Gökçe	General Directorate of Nature Conservation and National Parks	Ankara
117	İsmail Üzmez	General Directorate of Nature Conservation and National Parks	Ankara
118	Mustafa Yılmaz	General Directorate of Nature Conservation and National Parks	Ankara
119	Neşe Ersöz	General Directorate of Nature Conservation and National Parks	Ankara
120	Nurcihan Mercan Erdoğan	General Directorate of Nature Conservation and National Parks	Ankara
121	Mehmet Koç	General Directorate of Forestry Department Head of Foreign Relations Training and Research	Ankara
122	Ramazan Balı	General Directorate of Forestry Department of Foreign Relations Training and Research	Ankara
123	Kıymet Keleş	General Directorate of Forestry National Project Implementation Unit	Ankara
124	Türkan Özdemir	General Directorate of Forestry National Project Implementation Unit	Ankara
125	Cezmi Keleş	General Directorate of Forestry	Ankara
126	Nuran Karaçorlu	General Directorate of Forestry	Ankara
127	Şenol Oktay Keten	General Directorate of Forestry	Ankara
128	Uğur Tüfekçiöğlü	General Directorate of Forestry	Ankara
129	Yaşar Sönmez	General Directorate of Forestry	Ankara

no	Name of the Participant	Name of the Institution / Unit	Province
130	Erol Bulut	General Directorate of Livestock	Ankara
131	Nuray Beşaltı	General Directorate of Livestock	Ankara
132	Ömer Bedir Erdem	General Directorate of Livestock	Ankara
133	Ayşe Gökçe Yücel	General Directorate of Spatial Planning	Ankara
134	Simge Poyraz	General Directorate of Spatial Planning	Ankara
135	Esra Akçelik	General Directorate of Agricultural Research and Policies	Ankara
136	Hatice Özlem Gürbüz	General Directorate of Agricultural Research and Policies	Ankara
137	İhsan Çetin	General Directorate of Agricultural Research and Policies	Ankara
138	Naciye Çakır	General Directorate of Agricultural Research and Policies	Ankara
139	Şenay Boyraz Topaloğlu	General Directorate of Agricultural Research and Policies	Ankara
140	Arzu Özer	General Directorate of Agricultural Reform	Ankara
141	N. Cem Aktuz	General Directorate of Agricultural Reform	Ankara
142	Fatma Kurt	Retired Public Institution Personnel	Ankara
143	Özgün Talan	Antalya Provincial Directorate of Agriculture and Forestry	Antalya
144	Sinan Aykan	Antalya Provincial Directorate of Agriculture and Forestry	Antalya
145	Orhan Ceylan	6 th Regional Directorate	Burdur
146	Murat Yıldırım	15 th Regional Directorate	Diyarbakır
147	Oral Özgen	Diyarbakır Provincial Directorate of Agriculture and Forestry	Diyarbakır
148	Fehmi Yüksel	13 th Regional Directorate	Erzurum
149	Fethi Akman	Erzurum Provincial Directorate of Agriculture and Forestry	Erzurum
150	Şerafettin Çakal	General Directorate of Agricultural Research and Policies	Erzurum
151	Hüseyin İnce	3 rd Regional Directorate Gaziantep Branch Office	Gaziantep
152	Mustafa Gözel	3 rd Regional Directorate Gaziantep Branch Office	Gaziantep

no	Name of the Participant	Name of the Institution / Unit	Province
153	Bedir Katrancı	Gaziantep Provincial Directorate of Agriculture and Forestry	Gaziantep
154	Yılmaz Türk	İstanbul Provincial Directorate of Agriculture and Forestry	İstanbul
155	Mustafa Alkan	8 th Regional Directorate	Karaman
156	Durmuş Batu	Kars Provincial Directorate of Agriculture and Forestry	Kars
157	Ergun Yılmaz	Kayseri Provincial Directorate of Agriculture and Forestry	Kayseri
158	Hüseyin Gökdeniz	3 rd Regional Directorate Kilis Branch Office	Kilis
159	İ. Serhat Uğraş	8 th Regional Directorate	Konya
160	Mustafa Tuğrul Şahin	8 th Regional Directorate	Konya
161	Yakup Avcı	8 th Regional Directorate	Konya
162	Şevket Bozdağ	15 th Regional Directorate	Malatya
163	M. Beşir Ünat	3 rd Regional Directorate Mardin Branch Office	Mardin
164	Oral Özgen	Diyarbakır Provincial Directorate of Agriculture and Forestry	Diyarbakır
165	Üzeyir Tombul	Konya Provincial Directorate of Agriculture and Forestry	Konya
166	Mehmet Latif İnanç	Mardin Provincial Directorate of Agriculture and Forestry	Mardin
167	Fatih Süzgeç	Muş Provincial Directorate of Agriculture and Forestry	Muş
168	Recai Gündüz	Ordu Provincial Directorate of Agriculture and Forestry	Ordu
169	Özkan Bayrak	Osmaniye Provincial Directorate of Agriculture and Forestry	Osmaniye
170	Erol Çiftçi	Sivas Provincial Directorate of Agriculture and Forestry	Sivas
171	Orhan Kalay	3 rd Regional Directorate Şırnak Branch Office	Şırnak
172	Suat Safran	Van Provincial Directorate of Agriculture and Forestry	Van
173	M. Zülfü Yıldız	Adıyaman University	Adıyaman
174	Alptekin Karagöz	Aksaray University	Aksaray

no	Name of the Participant	Name of the Institution / Unit	Province
175	Selçuk Tuğrul Körüklü	Ankara University	Ankara
176	Bülent Gülçubuk	Ankara University	Ankara
177	F. Güler Ekmekçi	Hacettepe University	Ankara
178	Latif Kurt	Ankara University	Ankara
179	Nilgül Karadeniz	Ankara University	Ankara
180	Hayrettin Kendir	Ankara University	Ankara
181	Zekiye Çetinkaya	Ankara University	Ankara
182	Tuna Ekim	Retired Instructor	Ankara
183	Mecit Vural	Gazi University	Ankara
184	Burcu Tarıkahya Hacıoğlu	Hacettepe University	Ankara
185	Can Bilgin	Middle East Technical University	Ankara
186	Bilal Şahin	Çankırı Karatekin University	Çankırı
187	Recep Karakaş	Dicle University	Diyarbakır
188	Didem Ambarlı	Düzce University	Düzce
189	İtir Erhart	Bilgi University	İstanbul
190	Alper Hüseyin Çolak	İstanbul University - Cerrahpaşa Faculty of Forestry	İstanbul
191	Kenan Ok	İstanbul University - Cerrahpaşa Faculty of Forestry	İstanbul
192	Evrinm Karaçetin	Erciyes University	Kayseri
193	Hakan Gür	Ahi Evran University	Kırşehir
194	Zeki Acar	Ondokuz Mayıs University	Samsun
195	Aydan Özkil	The Food and Agriculture Organization of the United Nations (FAO) Program Assistant	Ankara
196	Burak Avcioğlu	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
197	Fatma Güngör	The Food and Agriculture Organization of the United Nations (FAO) Sustainable Land Management Project National Project Coordinator	Ankara
198	Nihan Yenilmez Arpa	The Food and Agriculture Organization of the United Nations (FAO) Steppe Project National Project Coordinator	Ankara

no	Name of the Participant	Name of the Institution / Unit	Province
199	Nilüfer Gündüz	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
200	Peter Pechacek	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
201	Sibel Nihal Tekin	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
202	Şafak Toros	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
203	Yeryeong Joo	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
204	S. Serhat Arda	ANÇEO	Ankara
205	İlker Özbahar	Nature Research Society	Ankara
206	İlhan Koçulu	Entrepreneur	İstanbul
207	Ercan Sütü	WWF-Turkey (DHKD)	Ankara
208	Mehmet Tural	WWF-Turkey (DHKD)	İstanbul
209	Volkan Büyükgüngör	Anadolu Meraları – Savory Institute	İstanbul
210	Durukan Dudu	Anadolu Meraları – Savory Institute	İstanbul
211	Cansu Dinç	Nature Conservation Centre Foundation	Ankara
212	Deniz Tapan	Nature Conservation Centre Foundation	Ankara
213	Fethiye Arslantaş	Nature Conservation Centre Foundation	Ankara
214	Gelincik Deniz Bilgin	Nature Conservation Centre Foundation	Ankara
215	Güliden Atkın Gençoğlu	Nature Conservation Centre Foundation	Ankara
216	Hakan Eligül	Nature Conservation Centre Foundation	Ankara
217	Melike Kuş	Nature Conservation Centre Foundation	Ankara
218	Mustafa Durmuş	Nature Conservation Centre Foundation	Ankara
219	Özge Balkız	Nature Conservation Centre Foundation	Ankara
220	Semiha Demirbaş Çağlayan	Nature Conservation Centre Foundation	Ankara
221	Tuba Bucak	Nature Conservation Centre Foundation	Ankara
222	Tuğsesu Toga	Nature Conservation Centre Foundation	Ankara
223	Uğur Zeydanlı	Nature Conservation Centre Foundation	Ankara
224	Yıldıray Lise	Nature Conservation Centre Foundation	Ankara
225	Zeynep Deniz Yalçın	Nature Conservation Centre Foundation	Ankara

ANNEX 5. Circular of the National Biodiversity Coordination Board

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GENETGE



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GENETGE 2019/15

Dünyanın biyolojik kaynakları, insanlığın ekonomik ve sosyal gelişimi için hayati öneme sahiptir. Biyolojik çeşitliliğin korunması, biyolojik kaynakların sürdürülebilir kullanımı ve genetik kaynakların kullanımından kaynaklanan faydaların adil ve hakkaniyete uygun şekilde paylaşımını amaçlayan Biyolojik Çeşitlilik Sözleşmesi ülkemiz tarafından 29/8/1996 tarihli ve 4177 sayılı Kanun ile onaylanarak uygun bulunmuştur.

2022-2024 yılları arasında Sözleşmenin dönem başkanlığı ülkemiz tarafından yürütülecek ve 2022 yılının son çeyreğinde düzenlenecek Biyolojik Çeşitlilik Konferansına ev sahipliği yapılacaktır. Küresel biyoçeşitlilik gündemindeki gelişmelerin takibi, biyolojik çeşitliliğin sürdürülebilir bir şekilde ekonomiye kazandırılması, Sözleşmenin ve dönem başkanlığının etkin olarak yürütülmesi amacıyla Tarım ve Orman Bakanı başkanlığında Ulusal Biyolojik Çeşitlilik Koordinasyon Kurulu (Kurul) kurulmuştur.

Kurul; Strateji ve Bütçe Başkanlığı, Cumhurbaşkanlığı Bilim, Teknoloji ve Yenilik Politikaları Kurulu, Tarım ve Orman, Çevre ve Şehircilik, Dışişleri, Enerji ve Tabii Kaynaklar, İçişleri, Kültür ve Turizm, Milli Eğitim, Sağlık, Sanayi ve Teknoloji, Ticaret, Ulaştırma ve Altyapı Bakanlıkları ile Türkiye Bilimsel ve Teknolojik Araştırma Kurumu, Türkiye Odalar ve Borsalar Birliği, Dış Ekonomik İlişkiler Kurulu ve Türk Mühendis ve Mimar Odaları Birliği Orman Mühendisleri Odası adına karar vermeye yetkili üst düzey temsilcilerin katılımıyla oluşur.

Kurul yılda en az bir defa toplanacak, çalışma usul ve esasları Kurul tarafından belirlenecek, Kurulun sekretarya hizmetleri ve koordinasyon işleri Tarım ve Orman Bakanlığı tarafından yürütülecektir. Kurul çalışmalarında ihtiyaç duyulacak ayrıntılı teknik bilgilerin alınması ve değerlendirilebilmesi amacıyla alt kurullar, teknik komiteler, danışma ve çalışma grupları oluşturulabilecektir. İlgili kamu kurum ve kuruluşlarının yanı sıra üniversiteler, sivil toplum temsilcileri, meslek birlikleri ve özel sektör temsilcileri Kurul toplantılarına davet edilebilecek; alt kurul, komite, danışma grupları ve çalışma gruplarında yer alabileceklerdir.

Kurul çalışmalarının bir bütünlük içinde yürütülmesi ve eşgüdümün sağlanması için tüm kamu kurum ve kuruluşlarınca gereken destek ve yardım sağlanacaktır.

Bilgilerimi ve gereğini rica ederim.

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Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project

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