

Republic of Türkiye

Ministry of Agriculture and Forestry

General Directorate of Forestry

Türkiye Resilient Landscape Integration Project (TULIP)

(P172562)

**Strategic Environmental and Social Assessment (SESA)  
Report  
for the Çekerek Project Area**

**JUNE 2022**



Food and Agriculture  
Organization of the  
United Nations

# SESA for Çekerek Project Area

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## ABBREVIATIONS

AFAD	Disaster and Emergency Management Authority
CLQ	Community Level Questionnaire
CORINE	Coordination of Information on the Environment
ÇKS	Farmer Registration System
CRB	Çekerek River Basin
CPA	Çekerek Project Area
DOKAP	Eastern Black Sea Project Regional Development Administration
DSI	General Directorate of State Hydraulic Works
E&S	Environmental and Social
EA	Environmental Assessment
EBS	Eastern Black Sea
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental and Social Impact Assessment
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESSs	Environmental and Social Standards
EU	European Union
EUNIS	European Nature Information System
FAO	Food and Agriculture Organization of the United Nations
FO	Field Offices
FMD	Forest Management Directorate
FMU	Forest Management Units
GAP	Gender Action Plan
GDP	Gross Domestic Product
GDNDP	General Directorate of Nature Conservation and National Parks
GDM	General Directorate of Meteorology
GDF	General Directory of Forestry
GHG	Green House Gas
GI	Green Infrastructure
GIS	Geographic Information System
GT	Government of Turkey
HQ	Headquarters
HHQ	Household Questionnaire
IAs	Implementing Agencies
IAIA	International Association of Impact Assessment
ILMP	Integrated Landscape Management Plans

## SESA for Çekerek Project Area

İŞKUR	Turkish Employment Agency
IUCN	International Union for Conservation of Nature
KGM	General Directorate of Highways
KOSGEB	Small and Medium Enterprises Development Organization
LPIS	Land Parcel Identification System
MCP	Microcatchment Plans
MDF	Medium-Density Fibreboard
MGM	Turkish State Meteorological Service
MHP	Nationalist Movement Party
MoAF	Ministry of Agriculture and Forestry
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MoTF	Ministry of Treasury and Finance
MTA	General Directorate of Mineral Research and Examination
NBM	National Basin Management
NGOs	Non-Governmental Organizations
NIBIS	Nitrate Information System
OGM	General Directorate of Forestry
OHS	Occupational Health and Safety
OIZ	Organized Industrial Zone
OMO	Turkish Chamber of Forest Engineers
PAD	Project Appraisal Document
PCU	Project Coordination Unit
PDs	Provincial Directorates
PDEU	Provincial Directorate of Environment and Urbanizations
PDH	Provincial Directorate of Health
PID	Project Information Document
PIF	Project Information File
PIU	Project Implementation Unit
PSC	Project Steering Committee
RDs	Regional Directorates
RIU	Regional Implementation Unit
RFD	Regional Forest Directorate
RP	Resettlement Plan
RF	Resettlement Framework
RSC	Regional Steering Committee
RST	Regional Support Team
RTSUs	Regional Technical Support Units
SES	Socio-Economic Status
SESA	Strategic Environmental and Social Assessment
SEA	Strategic Environmental Assessment

## SESA for Çekerek Project Area

SSA	Strategic Social Assessment
SEF	Stakeholder Engagement Framework
SEP	Stakeholder Engagement Plan
SSI	Social Security Institution
ŞÖNİM	Violence Prevention and Monitoring Center
RF	Resettlement Framework
LMP	Labor Management Procedures
TTLs	Task Team Leaders
TMP	Agriculture Master Plan
TOBB	Union of Chambers and Commodity Exchanges of Turkey
TRGM	General Directorate of Agriculture Reform
TULIP	Turkey Resilient Landscape Integration Project
TurkStat	Turkish Statistical Institute
UNESCO	United Nations Educational Scientific and Cultural Organization
USD	US Dollar
UTF	Unilateral Trust Fund
VEC	Valued Ecosystem Component
WB	World Bank
WBG	World Bank Group

# EXECUTIVE SUMMARY

## PROJECT DESCRIPTION

This Report is prepared in the scope of “Turkey Resilient Landscape Integration Project” (TULIP) that covers Bolaman and Cekerek Project Area (CPA), and presents the results of strategic environmental and social assessment (SESA) for CPA. A separate SESA Report has been prepared for Bolaman.

The project development objective of TULIP is to strengthen integrated landscape management and increase access to improved livelihood opportunities and resilient infrastructure for rural communities in targeted areas of Turkey.

TULIP will include a participatory planning process to take into account inputs from different stakeholder groups, allowing for the coordination and integration of solutions among different government agencies as well as between the government and local stakeholders.

TULIP will be composed of two main components to be able to implement integrated green and grey infrastructure solutions to mitigate the risks of landslides, floods, and drought, and enhance the resilience of the local population and natural resources. As TULIP will include Bolaman and Çekerek Basins, the components and sub-components are designed accordingly.

### **Component 1: Investments in Resilient Landscape Integration in targeted areas.**

This component will finance an integrated set of investments in the forestry, agriculture, water, and transport sectors by deploying an integrated landscape management model under a framework approach aimed at building the resilience of natural resources and rural livelihoods in the targeted basins.

This component will include four parts under two sub-components, implemented by OGM, TRGM, DSI, and KGM, respectively. This component will include two sub-components covering the set of green and gray infrastructure investments for the two identified basins.

**Sub-Component 1.1: Green Infrastructure and Sustainable Livelihoods** which aims to restore and maintain the health, function, and productivity of critical ecosystems and promote sustainable land uses within the target basins to improve the sustainability of the natural resource base, enhance the livelihood security of local communities, and build resilience against climate-induced hazards.

**Sub-Component 1.2: Resilient gray infrastructure** which aims to help local communities in targeted basins adapt to the impacts of climate change, including floods, sedimentation, landslides, and droughts, through improved access to resilient infrastructure services for protection against climate-related disasters, water storage, irrigation water supply, and year-round mobility.

**Component 2: Institutional Framework, Project Management, and Sustainability.** The objective of this component is to strengthen the capacity and coordination among TULIP Implementing Agencies to ensure not only effective and efficient project implementation, but

also the establishment of sustainable institutional structures and processes to support integrated landscape planning and management in both the project area and elsewhere. Scaling up the project's Integrated Landscape Management (ILM) model to other vulnerable rural areas will enable adaptation and resilience building, as well as job creation and sustainable recovery from the pandemic, on a large scale. Implementation of this component will be under the overall responsibility of OGM and will include the following two sub-components:

**Sub-Component 2.1: Implementation Framework for Integrated Landscape Management** which aims to support the development of a national strategy for landscape resilience and sustainable recovery for vulnerable rural areas, and the necessary institutional framework and capacity building to support its implementation; and

**Sub-Component 2.2: Project management and sustainability** which aims to include support for a Project Coordination Unit (PCU) and Regional Support Teams (RSTs) under OGM, and Project Implementation Units (PIUs) under KGM, TRGM and DSI.

The CPA is located within the provincial borders of Yozgat (Center, Akdağmadeni, Aydıncık, Çekerek, Çayıralan, Kadışehri, Saraykent, and Sorgun districts), Çorum (Alaca and Ortaköy districts), and Sivas (Yıldızeli district) provinces which are parts of the Central Anatolia Region and Tokat (Artova, Sulusaray and Yeşilyurt districts) province which is in the Black Sea Region.

CPA that is located between Yeşilirmak and Kızılırmak River Basins has a total area of 630,000 ha within the Çekerek River Basin area of 876,551 ha. The current population of districts in CPA is 225,618 (TurkStat, 2020).

The eligible sub-projects with corresponding project components and sub-components for CPA are given below.

### Project Components and Eligible Sub-Projects in CPA

Project Components	Implementing Agency (IA)
Component 1: Investments in Resilient Landscape Integration in targeted areas	
<i>Sub-Component 1.1. Green infrastructure and sustainable livelihoods</i>	
<i>(a) Forest landscapes and livelihood upstream</i>	
(i) Small-scale erosion, landslide, and flood control works upstream	OGM
(ii) Forest rehabilitation and sustainable management	
(iii) Forest pasture rehabilitation and sustainable management	
(iv) Income generation and livelihood diversification for forest villages	
<i>(b) Sustainable and climate-smart agricultural value chains</i>	
(i) Sustainable and climate-smart agricultural practices	TRGM
(ii) Pasture rehabilitation and sustainable management	
(iii) Agricultural diversification and sustainable value chains for rural villages	
<i>Sub-Component 1.2. Resilient gray infrastructure</i>	
<i>(a) Resilient infrastructure for water security</i>	

(i) Dams and small-scale multipurpose reservoirs	DSI
(ii) Irrigation works	
(iii) Flood and sedimentation control structures	
Component 2: Institutional Framework, Project Management and Sustainability	
<i>Sub-Component 2.1: Implementation Framework for Integrated Landscape Management</i>	
(i) Support for the establishment of implementation framework for ILM	OGM
(ii) Technical assistance for the development of guidelines to support the implementation of the national strategy for landscape resilience	
(iii) Assistance for the development of ILMPs and MCPs	
(iv) Support for the development of feasibility studies and E&S tools, as needed, for the additional priority basins	
(v) Capacity building and awareness-raising	
<i>Sub-Component 2.2: Project management and sustainability</i>	
(i) Strengthening capacity for day-to-day project management	OGM
(ii) Environmental and social risk management	
(iii) Grievance redress, citizen engagement and communications	
(iv) Monitoring and Evaluation	

## SESA OBJECTIVES and METHODOLOGY

The Report presents the process and results of a strategic environmental and social assessment for planning and implementing TULIP in CPA. SESA is performed in relation to:

- key environmental and social (E&S) issues/sensitiveness,
- assessment of relevance of sub-projects to the E&S priorities,
- E&S impacts and risks of sub-projects,
- E&S challenges and opportunities for better implementation,
- mitigation measures against possible adverse impacts and risks,
- sustainable and climate-resilient alternatives,
- approaches to enhance gender awareness and prioritization of vulnerable groups, and
- institutional set-up for overall management of impacts and risks.

The SESA methodology is comprised of a series of steps as described below:

- **Scoping of E&S Issues** that sets the overall frame for the entire SESA work; hence understanding the current state in the project area by means of desk-top reviews and field visits.
- **Identification and filling of gaps** for data requirements, which have been largely eliminated with the use of Community Level Questionnaires (CLQs) and Household Questionnaires (HHQs); in-depth interviews about gender issues; and finally data collected from government institutions and NGOs.

- **Stakeholder engagement** throughout the SESA process for ensuring a participatory assessment.
- **Prioritization of key issues** performed through a participatory approach making use of CLQs and HHQs, and establishing the project website for receiving opinions and comments from a broad range of stakeholders; mapping and Geographic Information System (GIS) applications for designating ecological hotspots and high-risk zones in terms of floods and landslides, that reflect on spatial planning of sub-projects.
- **Establishment of the baseline** by obtaining information requested from government organizations and the results of desk top reviews, site observations, interviews and community surveys.
- **Strategic E&S Assessment** that made use of categorizing the sub-projects under 6 rationale topics based on inter-linkages within and among them for an integrated understanding.
- **Mitigation measures** that concluded the strategic assessment with a set of recommendations to mitigate negative impacts that may arise individually or cumulatively during implementation/construction or after implementation/operation phases.
- **Cumulative Impact Assessment** that provides a complementary assessment to the strategic assessment, based on the Valued Ecosystem Components approach.

## INSTITUTIONAL FRAMEWORK

The responsibility for overall project management and coordination of TULIP will lie with the General Directorate of Forestry (OGM) under the Ministry of Agriculture and Forestry (MoAF). Other agencies that will be involved in project implementation include the General Directorate of Agricultural Reform (TRGM) and the State Hydraulic Works (DSI) under the MoAF, and the General Directorate of Highways (KGM) under the Ministry of Transport and Infrastructure.

A Project Steering Committee (PSC) will be established to ensure effective coordination among Implementing Agencies (OGM, TRGM, DSI, KGM). The PSC will include senior leadership from the Implementing Agencies (IAs), other relevant General Directorates (DGs), and representatives from other relevant institutions.

The Project Coordination Unit (PCU) will be established and housed within OGM at the central level, reporting directly to the Deputy General Director, who will act as PCU Head. OGM will assign a Project Coordinator who will be in charge of day-to-day project-related activities and coordination with other IAs for project execution. The PCU will be responsible for overall project coordination and management, including coordinating the development of project-related annual work plans and budgets with the other IAs, project supervision, monitoring and evaluation, and communication with and reporting to the World Bank (WB) on fiduciary, environmental and social aspects, and overall project implementation progress.

Central-level PIUs with an assigned Project Focal Point will also be established in each of the other IAs (TRGM, DSI, KGM) which will be in charge of Ankara-based project activities, including preparation of agency-specific project annual work plans and budgets and

coordination with their respective regional and/or provincial directorates. Activities at the basin level will be implemented by the Regional and/or Provincial (in the case of TRGM) Directorates (RD/PD) of each IA and their respective Field Offices (FO) through Regional Implementation Units (RIUs).

To increase the capacity for implementation in the field and ensure effective coordination among the IAs, two Regional Support Teams (RSTs) will be established under two Regional Directorates of OGM at the basin level.

Regional Project Steering Committees will also be established at the basin-level to ensure effective coordination with local authorities such as Provincial Governors, Municipal Administration and Services in the Bolaman basin, Special Provincial Administrations in CPA, producer organizations, civil society organizations, and other stakeholders.

A number of Departments from each IA will be involved in the design and implementation of project activities.

Other agencies that will be participating in project coordination and oversight include the DG of Water Management under the MoAF, the Ministry of Environment, Urbanization and Climate Change (MoEUCC), and the Disaster and Emergency Management Presidency (AFAD) of the Ministry of Interior, and others as needed and decided by the PSC.

The budget for the implementation of SESA recommendations is estimated as 675,000 USD.

## **BASELINE CONDITIONS**

### **Environmental Baseline**

The Cekerek Stream watershed is bounded by 39° 30' and 40° 45' N latitudes, and 35° 15' and 36° 15' E longitudes. Cekerek Stream is formed by the joining together of small streams that originate from the Kızılk, Dinar, Calı and Kavak hills, near Camlıbel district. Cekerek Stream is approximately 276 km in length. The stream joins the Yesilirmak River near Kayabası. The water quality of the stream is low salinity-low sodium, which can be used for irrigation purposes for plants with moderate salt tolerance in most cases without special practices for salinity control (Yürekli & Kurunç, 2004). This basin area covers approximately 1,165,440 ha, which is about 1.5% of Turkey's total area.

The erosion sensitivity of the basin reached 18 tons/ha/year. This value is considerably higher than average of Turkey. Erosion intensity is quite high due to the fact that the basin has an arid-semiarid climate and its slope values are high, which has a great effect on the erosion severity in the land cover. Dry farming is intensely carried out in the region and this increases the amount of erosion.

Qualitative research shows that the basin has high exposure to drought hazard. This exposure is higher in the northern areas of the basin since precipitation is higher in the southern areas, due to the increase in the altitude.

Flood events are very rarely seen at Çekerek Basin. Floods in the basin mostly occur following heavy storms.

In Çekerek Basin, while surface water is generally used for irrigation, groundwater is used as drinking and utility water purposes. In the basin, at present only Alaca Dam, located at the Alaca sub-basin is used for utility purposes. The Sürreyyabey Dam, which is located at Çekerek Stream, is used for irrigation and energy production purposes.

Supply risks are exerted by extensive groundwater withdrawals mainly for irrigation and livestock, but also for industrial and urban intakes as well, whereas water quality is degraded mainly by pollution due to agricultural factors.

CPA consists of four provinces Tokat, Yozgat, Sivas and Çorum, namely. Agricultural sector is the dominant in the regional economy. The main crops grown are wheat, barley, corn, legumes, tobacco, sugar beet and sunflower. In addition, a significant amount of fruit is produced in the central district, especially peaches. In the project area livestock breeding is also important.

There are a number of legally protected nature conservation areas and elements with high biodiversity value, within Çekerek Basin<sup>1,2</sup>. These include, Kadıpınarı and Oluközü Nature Parks in Akdağmadeni district of Yozgat and Ulukavak Nature Monument in Çekerek district of Yozgat.

Three of the 36 biodiversity hotspots of the world have extensive regions in Turkey<sup>3</sup>. These are Mediterranean Basin, Irano-Anatolian and Caucasus hotspots. Çekerek Basin project area has a minor overlap with the Irano-Anatolian biodiversity hotspot.

Within Çekerek Basin PA, three Key Biodiversity Areas (KBA) are present: Ballica Hills KBA, Kazankaya Valley KBA, and Akdağmadeni Forest KBA. Kazankaya Valley KBA is also an Important Bird Area (IBA). As listed in the site evaluations of KBAs and IBA, the critical species and habitats reported in these are listed in Table 6-18.

The existing literature may be insufficient to evaluate the presence of critical habitats in Çekerek Basin Project Area, since the project area is in vicinity of the Irano-Anatolian Hotspot, where steppe ecosystem dominates, harboring numerous rare, threatened, endangered and endemic plant species. Therefore, for those sub-projects that fall especially within the steppe ecosystem of the Çekerek basin project area, field surveys on the flora should be conducted by botanists within and near the sub-project local study area. These studies should be undertaken as part of sub-project specific assessment.

## **Social and Economic Baseline**

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<sup>1</sup> Ministry of Environment, Urbanization and Climate Change, Natural SITE Areas of Turkey, 2020. <https://www.csb.gov.tr/sit-alanlari/arama>

<sup>2</sup> Ministry of Agriculture and Forest, General Directorate of Nature Conservation and National Parks, Protected Areas of Turkey, 2020. <https://www.tarimorman.gov.tr/DKMP>

<sup>3</sup> Critical Ecosystem Partnership Fund, 2020. <https://www.cepf.net/our-work/biodiversity-hotspots>

## Population

Almost three quarters of the provinces in the basin live in the provincial and district centers. In general, it is seen that the population of the basin is in a continuous and rapid decrease. The main reason for this trend is migration from basin provinces to other provinces in Turkey and abroad.

The biggest reason for the decrease in the Basin population is the rapid migration of the rural population. The following points can be listed as the reasons for migration from rural areas: (i) decrease in the monetary return of the economic activities in rural areas, (ii) lack of employment. The reasons such as the loss of yield in agricultural production, the fact that production depends on natural events, the shrinkage of arable lands through inheritance over time accelerated the escape from agriculture.

## Age Groups

The proportion of the elderly population has increased due to migrations in the basin. The low fertility rate in the basin is also another reason of this increase as well.

Considering the migration figures of the basin provinces by age group, it is seen that the migration of the young and middle age population is higher, while the migration rate is lower among the elderly population. Therefore, the basin age dependency ratio is increasing.

## Economy

In the provinces of the CPA, the economy is largely based on agriculture, animal husbandry and agriculture-based industry. The majority of the adult population (Age 15 and over) works in the agricultural sector.

The main reasons for the rural-dominated out-migration in the basin are the decline in the level of government supports for rural economic activities, and the lack of employment. Small and fragmented farms results in very limited income from agricultural production. In addition, households in the basin do not traditionally grow high value cash crops.

In this case, the expectation of an increase in the disintegration in the agricultural sector, which triggers the migration phenomenon with the shift from agriculture to the service and industry sector in the next ten years, requires additional measures to be taken in the Region and especially in the basin, which is socio-economically dependent on agriculture.

## **IDENTIFICATION of KEY E&S ISSUES**

A series of thematic studies have been performed to verify the issues raised at local level by communities and representative of provincial and district-level authorities.

Identification of key issues is based on analytical work using GIS analysis, case studies and participatory rural appraisal methods. GIS analyses are performed by mapping and overlaying different sets of data to identify critical areas of concentration of environmental and social issues. Case studies are used in order to understand inter-sectoral linkages. Results of stakeholder surveys are used as a participatory rural appraisal tool at the community level.

A participatory approach has been adopted in prioritizing the social questions identified in the region. The prioritization strategy is presented in the methodology section. Online surveys were organized on the project website to determine a priority order among the social problems identified during the SESA fieldwork. These surveys, which will allow feedback for two weeks, still open for contribution.

Soil erosion is the major natural hazard potential in the CPA. Semi-arid characteristic together with weak vegetation coverage (specially at steep slope sections) poses potential risk for soil erosion.

Drought conditions and dry agriculture aggravate level of soil erosion. DSI has established irrigation networks at drought-prone areas with insufficient water. However, despite the irrigation systems in place, part of the land is not irrigated and the crop pattern is comprised of wheat mainly. This is indicative of the fact that farmers have not adapted to the irrigated agriculture, which underlines the importance of agricultural extension services, demonstration farms, farmers trainings.

The Kabalı village has an orchard developed over 500 hectares in Kadişehri district of Yozgat in 2019. The orchard is irrigated by means of drip irrigation system. The success in Kabalı is rooted in farmers awareness programmes and a series of trainings, marketing supports, grants and subsidies. However, despite the accessibility to irrigation systems, the surrounding farms continue with dry agriculture, not making use of the irrigation systems.

This shows that, without farmers awareness and training and financial support for on-farm systems, irrigation system investments may failed to achieve goals set for water supply and diversified agriculture in the basin in general. Hence a full-fledged Extension Programme seems prerequisite before transition to irrigated agriculture.

## **GENDER ANALYSES**

The overall objective of the gender assessment study is to mainstream gender issues into the SESA process and ensure the implementation of gender-responsive scoping, identification, assessment, and evaluation stages of the TULIP.

### **SESA for TULIP for ÇEKEREK**

After an in-depth analysis conducted for the sub-projects proposed by the pertinent organizations for TULIP Çekerek landscape, sub-projects have been categorized under certain rationales with respect to inter-linkages within and among them for an integrated understanding. This understanding also helps analyse the relations between project groups of different rationales and how integrated the whole approaches of different institutions operating in different service areas but in the same landscape. Rationale categorizations is also helping in assessing the sub-projects' relevance as well as the area of intervention with the environmental and social prioritized issues of the Çekerek Project Area.

Rationale 1: Improve resilience for control of floods, sedimentation and water erosion

Rationale 2: Increasing livestock assets and related livelihood activities

Rationale 3: Enhancing sustainable forests and forest-based livelihoods

Rationale 4: Creating income generation by promoting tourism

Rationale 5: Income-generation by encouraging agricultural diversity

Rationale 6: Expansion of Irrigated Farming

## **MITIGATION MEASURES**

Mitigation measures for each rationale and corresponding sub-projects are geared to more sustainable, effective, environmentally sound and socially sensitive planning and implementation of the sub-projects.

Majority of the mitigations essentially depend on cooperation among the IAs and also with other government stakeholders in the project area. In this respect, the role of the Steering Committee (SC) would be very important to assure this coordination and cooperation in a timely and fluent manner.

## **CUMULATIVE IMPACT ASSESSMENT**

Considering the environmental and social impacts of the Project, the Valued Ecosystem Components (VECs) are listed against the Project to check whether they are prone to cumulative impacts. Impact issues evaluated with the terms “negligible” or “minor” as the outcome of environmental and social impact assessment are scoped out from the cumulative impact assessment. Priority is given to those VECs that are likely to be at the greatest risk from the Project’s contribution to cumulative impacts.

VECs scoped into the cumulative assessment are downstream water rights, aquatic biodiversity, and community health and safety. A mitigation approach is defined for each VEC.

## **CONCLUSION**

Climate resilience is driving concern for a series of investments in CPA, underlined by drought and soil erosion that impose impacts on the regional socio-economic status. Çekerek basin presents an exemplary case for identifying the vulnerabilities over a landscape mainly defined by the catchment area of Çekerek River.

Mitigation measures in response to investments are mainly related with ensuring coordination and cooperation between implementing partners as well as other primary stakeholders, hence adaptation to and mitigating climate change necessitates a holistic approach of the different institutions working in a harmonized manner.

Another key element of the mitigation measures is comprised of a broad range of farmer trainings to be structured within the scope of a full-fledged Extension Programme. The Extension Program should be commenced before implementation of pertinent sub-projects so that farmers are prepared for transition to new agricultural practices. The Extension Programme should be comprehensive to include on-farm equipment needs, organizational aspects (i.e. water-user associations); needs for use of appropriate seeds, pesticides, fertilizers; irrigation techniques, etc.

# 1. INTRODUCTION

According to Turkey's Eleventh Development Plan for the 2019-2023 period; Turkey is among the countries that will be affected adversely from the climate change and is already facing an increased incidence of sudden rains, flood and drought. Turkey is already paying a significant attention to a sustainable and inclusive growth pathway. In this context, regarding the protection and effective use of water resources, River Basin Management Plans, Sectoral Water Allocation Plans, Basin Master Plans, Drought Management Action Plans, Flood Management Action Plans and Drinking Water Basins Protection Action Plans will be completed in the 25 basins of the country. Additionally, the Plan also gives attention to the Protection of Environment; aiming to protect the environment and natural resources, improve quality, ensure effective, integrated and sustainable management, implement environment- and climate-friendly practices in all areas specifically water basins.

The General Directorate of Forestry (OGM), under the Ministry of Agriculture and Forestry (MoAF), has initiated a project preparation for the Basin titled "Turkey Resilient Landscape Integration Project (TULIP)" to address the challenges facing the Bolaman Basin and the Çekerek Project Area while enhancing the livelihood security and resilience of local communities against the risks and impacts of climate-induced landslides, flooding, and drought. The Project will have an integrated landscape management approach at the sub-basin scale to achieve these objectives in line with the plans detailed above.

OGM together with the main national and local implementing institutions explored several finance options for the Turkey Resilient Landscape Integration Project. Finally, the OGM decided to work with the World Bank (WB) in cooperation with the Ministry of Treasury and Finance. Following the initial discussions with the WB resulted in agreement for both Bolaman and Çekerek Project Areas.

Considering Food and Agriculture Organisation of the United Nations (FAO) expertise in the integrated natural resources management and capacity constraints of national institutions, OGM officially requested from FAO to support the preparation of preparatory documents (such as Feasibility Report, Strategic Environmental and Social Assessment (SESA) Report and Environmental and Social Framework (ESF) Instruments) for the approval of TULIP by the national bodies and the WB as well as its implementation. The FAO SESA team, which includes environmental and social experts, was established for the preparation of these documents. Necessary literature review, field studies, consultation activities were carried out and all documents were prepared by the SESA team.

The Government of Turkey (GT) has agreed that FAO Turkey takes the lead in preparation of documents through a Unilateral Trust Fund (UTF) Agreement (UTF Project) and provides the required technical assistance in close collaboration and coordination with the MoAF and other concerned Government agencies as well as related Non-Governmental Organizations at national, regional and district levels. GT is committed to providing all necessary input, staff and institutional arrangements to ensure the timely and effective start-up, implementation and follow-up of the requested assistance.

Among national Government agencies, OGM is the coordinator whereas, the General Directorate of Agricultural Reform (TRGM) and the General Directorate of State Hydraulic Works (DSI) of the MoAF as well as the General Directorate of Highways (KGM) of the Ministry of Transport and Infrastructure are the other implementing institutions which also to be funded from the Project. Further, the Ministry of Treasury and Finance (MoTF) and the President's Strategy and Budget Office (SBO) will act as the financial supervisors of the Project.

The Project will be composed of two main components to be able to implement integrated green and grey infrastructure solutions to mitigate the risks of landslides, floods, and drought, and enhance the resilience of the local population and natural resources. As the Project will include Bolaman and Çekerek Basins, the components and sub-components are designed accordingly. This Report covers only Çekerek Project Area, and a separate SESA Report has been prepared for Bolaman.

## 2. PROJECT DESCRIPTION

This chapter provides an overall description of TULIP and Çekerek Project Area (CPA) where TULIP investments are planned.

### 2.1. Project Area

The Project area is located within the provincial borders of Yozgat (Center, Akdağmadeni, Aydıncık, Çekerek, Çayıralan, Kadışehri, Saraykent, and Sorgun districts), Çorum (Alaca and Ortaköy districts), and Sivas (Yıldızeli district) provinces which are parts of the Central Anatolia Region and Tokat (Artova, Sulusaray and Yeşilyurt districts) province which is in the Black Sea Region. A large part of the Project Area falls into Yozgat province border (see Figure 2-1).

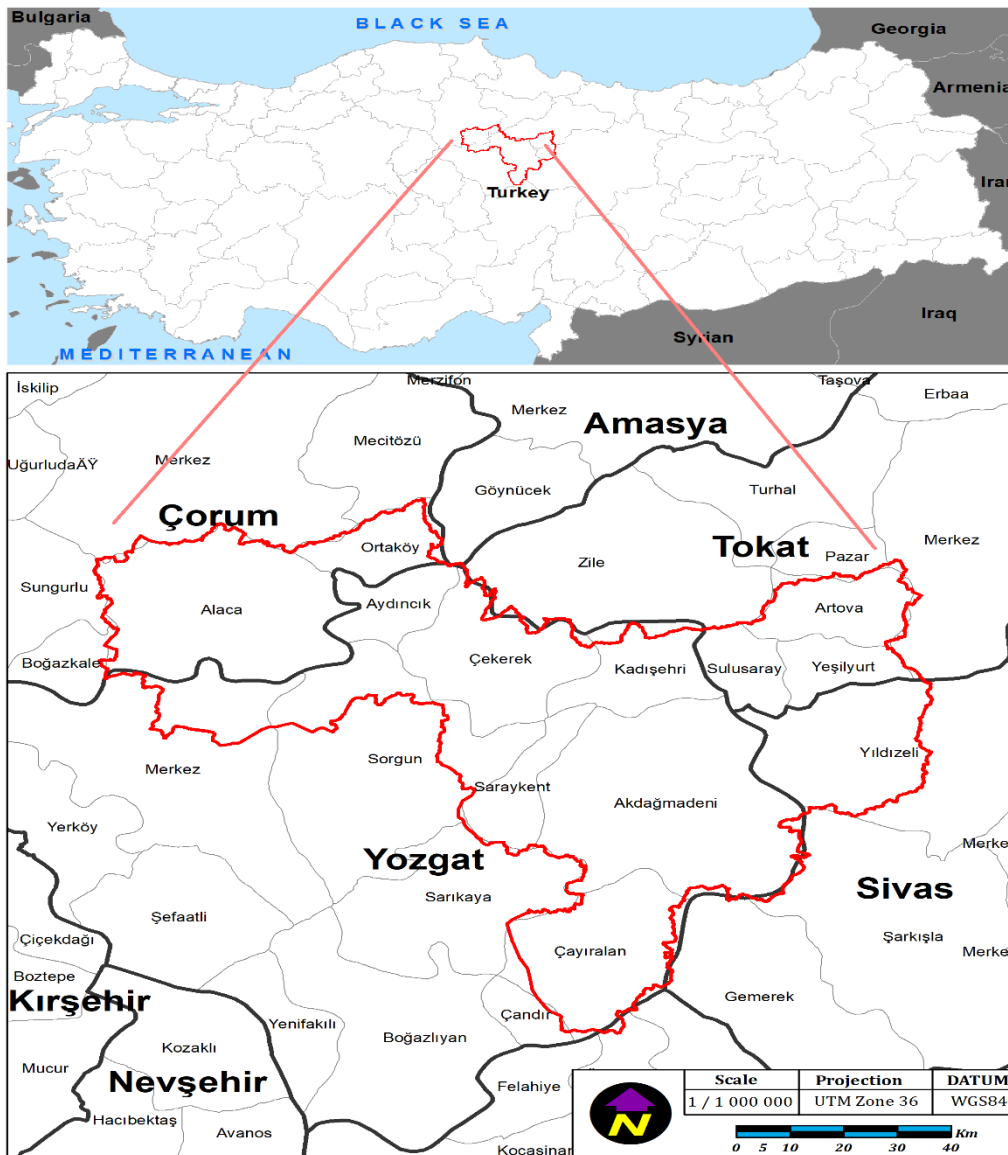


Figure 2-1 Location of the Project Area

CPA that is located between Yeşilırmak and Kızılırmak River Basins has a total area of 630,000 ha within the Çekerek River Basin area of 876,551 ha. The current population of districts in CPA is 225,618 (TurkStat, 2020). The elevation of CPA changes between 531 m. to 2,357 m. The North-South length of the basin along Alaca-Yıldızeli is 156 km; and the width along Çayıralan-Kadışehir line in East-West is 98 km. The geographic location of the Çekerek Project Area (CPA) can be seen in Figure 2.1 above. Çekerek Project Area does not fully match with Çekerek River Sub-basin boundaries. While northern parts of Çekerek Sub-basin reside in Çorum, Amasya and Tokat are excluded from the CPA, settlement areas located at the southern in Yozgat Province that falls into Kızılırmak Basin are included into CPA.

Figure 2-2 compares the boundaries of Çekerek River Sub-basin and Çekerek Project Area. CPA boundaries are established considering integrated landscape management approach rather than conventional water basin approach.

SESA Report uses CPA terminology throughout the document excluding some paragraphs and/or sub-sections for which use of “basin” terminology is technically inevitable.

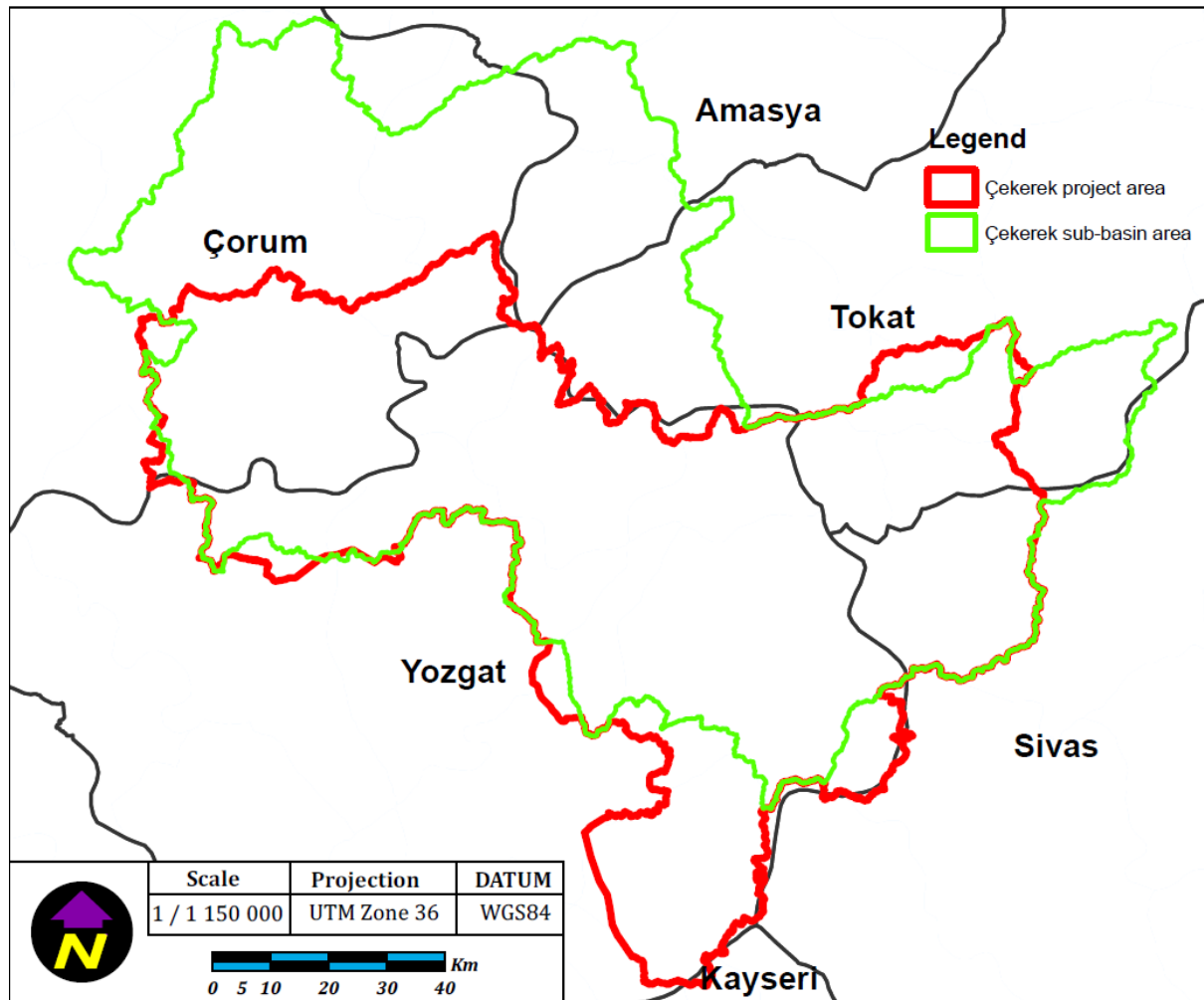


Figure 2-2 Comparison of Çekerek River Sub-Basin Borders and Çekerek Project Area

## 2.2. Turkey Resilient Landscape Integration Project (TULIP)

The project development objective is to strengthen integrated landscape management and increase access to improved livelihood opportunities and resilient infrastructure for rural communities in targeted areas of Turkey.

TULIP will include a participatory planning process to take into account inputs from different stakeholder groups, allowing for the coordination and integration of solutions among different government agencies as well as between the government and local stakeholders.

- **TULIP will comprise of integrated green and grey infrastructure solutions** as both short-term and long-term responses to mitigate the risks of erosion, floods, and drought, and enhance climate resilience of the local populations and ecosystems.
- **Green infrastructure** that will include: i) afforestation and erosion control works; ii) reservoirs and dam for sustainable irrigation; iii) rehabilitation and climate-smart pasture management; iv) income generation and livelihood diversification activities for poor forest communities, such as bee-keeping, greenhouse cultivation, v) improvement of livestock productivity to reduce environmental and natural resources footprint; vi) climate resilient and energy-efficient agri-food value chains to enhance market access for local farmers; and vi) branding and marketing of sustainably produced agricultural products.
- **Climate resilient grey infrastructure** that will increase access to climate-resilient infrastructure systems for protection against climate-related disasters such as landslides, sedimentation and floods, and for provision of drinking water supply, sanitation, and mobility for local communities.

The proposed Project will support the GT in addressing the multitude of environmental and socio-economic challenges facing the Bolaman basin in the Eastern Black Sea and the Çekerek basin in Central Anatolia while enhancing the livelihood security and resilience of local communities against the risks and impacts of climate-induced landslides, flooding, and drought.

The Project will adopt an integrated landscape management approach in the targeted basins to achieve these objectives through synergies between green and gray infrastructure, while balancing between urgent needs and long-term benefits. Building upon the GT and the Bank's previous experience in watershed rehabilitation, this project will implement a participatory planning process to incorporate inputs from different stakeholder groups, allowing for the coordination and integration of solutions among various government agencies, and between government and local stakeholders. Using Bolaman and Çekerek Basins as proof of concept, the Project will set in motion a national program for landscape resilience and sustainable recovery in lagging rural areas.

The Project will be composed of two main components to be able to implement integrated green and grey infrastructure solutions to mitigate the risks of landslides, floods, and drought, and enhance the resilience of the local population and natural resources. As TULIP will include

Bolaman and Çekerek Basins, the components and sub-components are designed accordingly.

### **Component 1: Investments in Resilient Landscape Integration in targeted areas.**

This component will finance an integrated set of investments in the forestry, agriculture, water, and transport sectors by deploying an integrated landscape management model under a framework approach aimed at building the resilience of natural resources and rural livelihoods in the targeted basins. These investments aim to address the multifaceted constraints in these basins that result in higher rural poverty and outward migration, such as resource degradation, water insecurity, and vulnerabilities to climate and disaster risks. As infrastructure solutions are urgently needed to address these challenges in the targeted basins, a selected subset of investments will be initiated during early project implementation as concrete no-regret measures defined as first steps in a process that ensures sustainable development and future resilience. The investment prioritization criteria of these early-stage investments will be specified in the POM, and these investments will be subject to site-specific environmental and social assessment. The selection criteria will include, inter alia, those to identify environmental and social risks, importance of investment to improve the critical resilience and mitigate disaster risks. These investments will be agreed with stakeholders and approved by the Bank.

The investments under this component will include a variety of green and gray infrastructure measures, including sustainable land management and livelihoods diversification by the General Directorate of Forestry (OGM) and the General Directorate of Agricultural Reform (TRGM); and resilient infrastructure systems for drinking water storage, irrigation water supply, flooding and sediment control, and road rehabilitation for improved local mobility and market access by the State Hydraulic Works (DSI) and the General Directorate of Highways (KGM). The integration among the different measures will be established through the development of Integrated Landscape Management Plans (ILMPs), which will be completed during the first year of project implementation, building on the participatory processes and Strategic Environmental and Social Assessment (SESA) developed for each basin so as to determine the locations of NBS and green infrastructure measures that will complement the gray infrastructure systems at the landscape scale to optimize the combined function of green and gray interventions. The Project Operational Manual (POM) will prescribe the relevant criteria, procedures, technical guidelines, and implementation mechanisms for selecting and implementing green infrastructure activities under Sub-component 1.1 and gray infrastructure sub-projects under Sub-component 1.2. The POM will also include guidelines and modalities for Operation and Maintenance (O&M) arrangements for infrastructure systems financed by the Project.

This component will include four parts under two sub-components, implemented by OGM, TRGM, DSI, and KGM, respectively. This component will include two sub-components covering the set of green and gray infrastructure investments for the two identified basins.

Sub-Component 1.1: Green Infrastructure and Sustainable Livelihoods. The objective of this sub-component is to restore and maintain the health, function, and productivity of critical ecosystems and promote sustainable land uses within the target basins to improve the

sustainability of the natural resource base, enhance the livelihood security of local communities, and build resilience against climate-induced hazards. This sub-component will finance a range of investments which will be planned in a participatory manner with targeted communities through the development of priority Micro-Catchment Plans (MCPs) in each respective basin. Investments will include a variety of green infrastructure<sup>4</sup> (GI) measures, sustainable and climate-smart agricultural practices, and livelihood diversification activities to be implemented by OGM and TRGM through their Regional and Provincial offices. The project will maximize the synergies among different interventions to the extent possible. GI will strengthen ecosystem services for long-term climate adaptation and mitigation co-benefits such as soil, water and sediment retention, flood and landslide risk reduction, and carbon sequestration. These benefits will help sustain productive agriculture and build resilience in the long run. GI will also provide habitats for enhanced biodiversity and generate economic benefits through nature-based tourism. Income generation and livelihood diversification for the rural poor will enhance their livelihood security and welfare, help reduce pressure on the forest ecosystems, and could contribute to reducing outward migration. Livelihood enhancement will be achieved through improvements in agricultural productivity, diversification of farm products, and value enhancement of selected products. Sustainable land use practices will be promoted through livelihood diversification activities (i.e., use of greenhouses, manure management), and demonstrative climate-smart agricultural practices. Investments targeting improved production and diversification initiatives will have a strong emphasis on market demands, with training and support for improving market access, including for establishing producer-buyer linkages and enhancing product quality and/or differentiation. This sub-component will include two parts, implemented by OGM and TRGM respectively.

The Project Operational Manual (POM) will include guidelines for the screening and selection of sub-projects to ensure alignment with the PDO as well as technical feasibility, financial and economic suitability, and environmental and social sustainability. In the event that new sub-project typologies are required to address unforeseen challenges, those typologies will be appraised for technical, financial, economic, environmental, and social sustainability. Potential green infrastructure, livelihood and agricultural diversification will follow applicable technical guidelines, which will be included in the POM, for sustainable and climate-smart agriculture, NBS implementation and biodiversity mainstreaming, and climate and disaster-resilient infrastructure. Energy efficient measures or technologies will also be incorporated where feasible. The selection process will be conducted by OGM, in close consultation and collaboration with other agencies and the World Bank.

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<sup>4</sup> Green infrastructure (also sometimes called natural infrastructure, or engineering with nature) intentionally and strategically preserves, enhances, or restores elements of a natural system, such as forests, agricultural land, floodplains, riparian areas, coastal forests (such as mangroves), among others, and combines them with gray infrastructure to produce more resilient and lower-cost services. Gray infrastructure is built structures and mechanical equipment, such as reservoirs, embankments, pipes, pumps, water treatment plants, and canals.

**1.1A Forest Landscapes and Livelihoods Upstream.** This sub-component will be implemented by OGM. It aims to enhance landscape resilience and the long-term livelihood security for upland forest communities in the targeted basins through NBS/GI measures, small-scale works, and livelihood investments. Sub-project typologies include:

- (i) *Small-scale erosion, landslide, and flood control works upstream* aimed at conserving soil, reducing erosion and sedimentation, mitigating landslides, and decreasing runoff, peak flow, and magnitude of flooding downstream. Activities under this sub-project typology will include: (a) preparatory studies for design of erosion, landslide, and flood control measures; (b) soil conservation and erosion control works (i.e., terracing, revegetation, wire mesh fences, etc.); and (c) upstream flood and landslide control small works (i.e., retaining walls, etc.).
- (ii) *Forest rehabilitation and sustainable management* activities aimed at protecting, restoring, and maintaining the health and functionality of basin forests to deliver critical ecosystem services, including soil cover protection, erosion prevention, water retention and regulation, climate adaptation (i.e., buffering against floods and extreme events) and mitigation (i.e., carbon sequestration). Activities supported under this sub-project typology include: (a) afforestation and reforestation; (b) forest rehabilitation; (c) maintenance of young forests; (d) production of saplings; (e) production of non-timber forest products; (f) establishment of small facilities for enhancing the ecotourism potential of the target basins; and (g) support, through matching grants, for the adoption of alternatives to fuelwood for cooking and heating (i.e., solar energy heating systems and roofing and insulation materials) in order to reduce pressure on forest resources.
- (iii) *Forest pasture rehabilitation and sustainable management* activities aim at improving the health, carrying capacity, and productivity of pastures in and adjacent to forest lands upstream to support forest communities' livestock farming in a productive and sustainable way. Healthy pastures will also help reduce methane emissions, improve carbon pools, minimize soil erosion, improve water retention upstream, and reduce runoff downstream. Activities under this sub-project typology include: (a) grazing land rehabilitation and management (i.e., restoration of degraded pasture lands, rotational grazing, etc.); and (b) establishment of small facilities for livestock welfare and productivity.
- (iv) *Income generation and livelihood diversification for forest villages* aims at creating new income-generating opportunities to directly enhance the livelihood security for poor forest communities and reduce the pressure on forest ecosystems upon which these communities traditionally depend. During the participatory MC planning process, beneficiaries will select options from a range of income-generating activities which were pre-identified through the stakeholder engagement process during project preparation. These activities will be supported on a cost-sharing basis through small matching grants, including: (a) horticulture (i.e., cultivation of alternative high value products such as truffle and berries); (b) animal husbandry (i.e., small scale high-yield cattle breeding and farming); (c) sustainable apiculture; and (d) women-led enterprises in forest villages.

**1.1.B. Sustainable and climate-smart agricultural value chains.** This sub-component will be implemented by TRGM. It aims to improve livelihood opportunities for rural communities through the promotion of sustainable and climate-smart agricultural practices and enhancement of selected value chains in targeted basins. Diversifying livelihoods and promoting sustainable and climate-smart agricultural production will help protect the natural

resource base, improve farm productivity, and strengthen communities' adaptation and resilience capacity. Agricultural value chain investments will help boost the marketability and value of select local products. Sub-project typologies include:

- (i) *Sustainable and climate-smart agricultural practices* aimed at reducing soil erosion, conserving water, and enhancing nutrient capture to improve farm productivity and minimize harmful agricultural runoff. Activities will be tailored to the specific conditions of each basin and guided by sustainability and climate-smart criteria. Activities supported under this sub-project typology include: (a) preparatory studies for soil management; (b) dissemination of high quality and climate-resilient seeds; and (c) matching grant support for the promotion of cultivation techniques for soil health and water retention, Good Agricultural Practices for selected crops, and small water-efficient irrigation systems. The project will not implement such measures on a massive scale; rather, it will aim to have a demonstrative effect to encourage and facilitate land users themselves to adopt more productive and protective land management systems across the basins.
- (ii) *Pasture rehabilitation and sustainable management outside forest lands.*<sup>5</sup> As in the case of forest pastures above, activities under this sub-project typology will support improvements in: (a) grazing land rehabilitation and management; combined with (b) establishment of small facilities to enhance livestock welfare and productivity (i.e., animal sheds with feed storage, caregiver houses, and livestock drinking water systems, etc.). These investments will help improve the resilience of livestock systems, as well as the productivity, carrying capacity, and climate mitigation potential of rural pasture lands by increasing fodder quantity and quality, reducing methane emissions, improving carbon pools, minimizing soil erosion, and providing a sustainable resource base for the activities supported under the following sub-project typology.
- (iii) *Agricultural diversification and sustainable value chains for rural villages*, aimed at promoting income diversification of poor rural communities and enhancing the performance of selected value chains suitable for the selected basins. These activities will be supported on a cost-sharing basis through small matching grants, including: (a) supporting enhanced production and market linkages of existing value chains, such as cattle/dairy cattle (e.g., via improved breeds, application of good animal husbandry practices such as improved animal health services, on-farm manure management, etc.); hazelnuts (e.g., via improved postharvest drying process to reduce spoilage and enhance quality and value); and beekeeping (e.g., via enhanced quality production and product differentiation), among others; (b) expanding opportunities for income diversification in new products/markets, for example, via cultivation and strengthening market linkages for high value products such as truffles, persimmon, dates, mushrooms, fruits, etc.; (c) supporting women-led enterprises in rural areas to enhance product quality and support product differentiation in the market place; and (d) support for youth employment initiatives in the agricultural sector. By helping rural communities

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<sup>5</sup> In accordance with the Pasture Law No. 4342, OGM carries out rehabilitation activities in the pasture lands inside and adjacent to forests, while TRGM is responsible for pasture lands outside forests.

diversify livelihoods vulnerable to climate change impacts, these investments will also help build their adaptation and resilience capacity.<sup>6</sup>

**Sub-Component 1.2: Resilient gray infrastructure.** The objective of this sub-component is to help local communities in targeted basins adapt to the impacts of climate change, including floods, sedimentation, landslides, and droughts, through improved access to resilient infrastructure services for protection against climate-related disasters, water storage, irrigation water supply, and year-round mobility. These investments will be appraised through sub-project-specific feasibility studies, economic analysis, and environmental and social assessments. Engineering designs will incorporate suitable climate and disaster resilient measures through specific resilient infrastructure guidelines developed for the planned sub-project typologies based on basin-wide vulnerability assessments carried out during project preparation. GI will be designed to complement the gray infrastructure and optimize the functionality, cost-effectiveness, and resilience of the integrated natural and built system. This sub-component will include two parts, implemented by DSI and KGM respectively.

**1.2.A. Resilient infrastructure for water security.** This sub-component will be implemented by DSI. It aims to provide local communities with resilient infrastructure systems for drinking water storage, irrigation water supply, protection against climate-induced flooding, and sedimentation control. Sub-project typologies will include:

- (i) *Dams and small-scale multipurpose reservoirs* will store and protect surface water sources and ensure the availability of water during low precipitation months and periods of seasonal droughts to enable the supply of drinking and irrigation water. The reservoirs will contribute to preserving and increasing groundwater reserves through reduced groundwater extraction. Depending on the location, reservoir capacities, and flood peaks, the reservoirs will have multiple functions, such as stream flow control to prevent and minimize flooding incidents.
- (ii) *Irrigation works*, including small irrigation ponds and irrigation systems, will supply water to support agricultural activities in targeted basins with drought and/or water scarcity problems. The availability of irrigation water will help local communities in these basins adapt to current and future climate change impacts and improve their agricultural productivity and farm incomes. Irrigation technologies employed will be drip and low-pressured sprinkler systems, which will save both water and energy, and hence will be more efficient and cost-effective.
- (iii) *Flood and sedimentation control structures* downstream will prevent and mitigate the impacts of floods, which have caused loss of life and significant damages to local infrastructure, properties, and agricultural assets, and are even more damaging with

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<sup>6</sup> The main agricultural products in BRB (hazelnut) and CRB (field crops) are highly vulnerable to the impacts of climate change. Hazelnut production is impacted by changes in seasonal temperature and precipitation patterns and extreme climatic conditions such as early spring frosts, hails, and heavy precipitation; field crops, such as wheat and barley, are adversely impacted by increased and prolonged droughts. As the majority of farmers in BRB and CRB depend on these key agricultural products, diversifying from these vulnerable livelihood sources, including a shift to more climate-resilient products, will help reduce their vulnerabilities and build resilience to the impacts of climate change.

landslides occurring during periods of heavy precipitation. Flood and sediment control structures will include check dams, levees, retaining walls, embankments, culverts, bridges, concrete channels, grouted riprap, and stream bed rehabilitation, among others. Specific locations will be determined through hydraulic modeling, historical flood records, flood risk mapping, and other relevant analysis.

**1.2.B. Resilient mobility.** This sub-component will be implemented by KGM. It aims at enhancing the resilience of select rural road segments in target basins against climate and disaster risks and improving local communities' year-round mobility and access to markets for employment and commercial opportunities. In BRB for example, heavy precipitation, flooding, landslides, and rockslides have deteriorated the rural road network, causing traffic disruption, posing safety issues, and impeding the flow of goods and people. Improving the conditions and functionality of critical road segments in this basin will facilitate local labor mobility and transportation of agricultural goods and contribute to encouraging tourist inflows. Sub-project typologies will include:

- (i) *Resilient rural road rehabilitation* will include widening of the lane width to standard levels (by additional 2 meters) to meet safety requirements and resurfacing using hot mix bituminous asphaltic concrete (BSK), a water and weather resistant material, to fill in existing cracks and fix raveled surfaces in the select road segments. BSK will protect the underlying pavement and prevent surface material from washing away from heavy rainfalls and flooding. Comparing to the current surface conditions, BSK will also increase skid resistance to improve traffic safety, decrease vehicle operating costs due to lower surface roughness, and withstand occasional overloads without causing any serious damage. The rehabilitation will also incorporate measures such as drainage systems and protective walls to strengthen the existing road's resilience against climate and disaster risks and impacts.

**Component 2: Institutional Framework, Project Management, and Sustainability.** The objective of this component is to strengthen the capacity and coordination among TULIP Implementing Agencies to ensure not only effective and efficient project implementation, but also the establishment of sustainable institutional structures and processes to support integrated landscape planning and management in both the project area and elsewhere. Scaling up the project's Integrated Landscape Management (ILM) model to other vulnerable rural areas will enable adaptation and resilience building, as well as job creation and sustainable recovery from the pandemic, on a large scale. Implementation of this component will be under the overall responsibility of OGM and will include the following two sub-components:

**Sub-Component 2.1: Implementation Framework for Integrated Landscape Management.** The aim of this sub-component is to support the development of a national strategy for landscape resilience and sustainable recovery for vulnerable rural areas, and the necessary institutional framework and capacity building to support its implementation. The implementation framework for integrated landscape management will prioritize, guide, and facilitate landscape restoration and integrated NRM, sustainable livelihood support, and resilience and adaptation building activities in rural areas vulnerable to climate and disaster risks. Activities under this component will include: (i) support for the establishment of the implementation framework for Integrated Landscape Management, including the development

and adoption of a national strategy for landscape resilience and sustainable recovery in vulnerable rural areas and the associated regulatory mechanism for institutional coordination; (ii) technical assistance for the development of guidelines to support the implementation of the national strategy for landscape resilience, including for the design of integrated planning tools at the landscape level combining green and gray infrastructure solutions (ILMPs, MCPs, and others); (iii) assistance for the development of ILMPs and MCPs for the BRB and CRB; (iv) support for the development of feasibility studies and Environmental and Social (E&S) tools, as needed, for additional priority basins; and (v) capacity building and awareness raising for relevant institutions, local authorities, and rural communities for the implementation of sustainable landscape management practices, including on dam safety issues.

**Sub-Component 2.2: Project management and sustainability.** Activities under this sub-component will include support for a Project Coordination Unit (PCU) and Regional Support Teams (RSTs) under OGM, and Project Implementation Units (PIUs) under KGM, TRGM and DSI for: (i) strengthening capacity for day-to-day project management on technical, fiduciary, monitoring and evaluation, environmental, and social issues ; (ii) environmental and social risk management, including preparation of site-specific Environmental and Social (E&S) instruments and dam safety issues; (iii) grievance redress, citizen engagement, and communications; and (iv) Monitoring and Evaluation (M&E) of project activities, including impact assessments, beneficiary satisfaction surveys, and development of an integrated data platform for monitoring of key landscape variables.

The eligible sub-projects with corresponding project component and sub-component are given in below for CPA. Please see Annex 1 for a brief description of sub-projects.

Table 2-1 below for CPA. Please see Annex 1 for a brief description of sub-projects.

**Table 2-1. Project Components and Eligible Sub-Projects in CPA**

Project Components	Implementing Agency (IA)
Component 1: Investments in Resilient Landscape Integration in targeted areas	
<i>Sub-Component 1.1. Green infrastructure and sustainable livelihoods</i>	
<i>(a) Forest landscapes and livelihood upstream</i>	
(i) Small-scale erosion, landslide, and flood control works upstream	OGM
(ii) Forest rehabilitation and sustainable management	
(iii) Forest pasture rehabilitation and sustainable management	
(iv) Income generation and livelihood diversification for forest villages	
<i>(b) Sustainable and climate-smart agricultural value chains</i>	
(i) Sustainable and climate-smart agricultural practices	TRGM
(ii) Pasture rehabilitation and sustainable management	
(iii) Agricultural diversification and sustainable value chains for rural villages	
<i>Sub-Component 1.2. Resilient gray infrastructure</i>	
<i>(a) Resilient infrastructure for water security</i>	
(i) Dams and small-scale multipurpose reservoirs	DSI

(ii) Irrigation works	
(iii) Flood and sedimentation control structures	
Component 2: Institutional Framework, Project Management and Sustainability	
<i>Sub-Component 2.1: Implementation Framework for Integrated Landscape Management</i>	
(i) Support for the establishment of implementation framework for ILM	OGM
(ii) Technical assistance for the development of guidelines to support the implementation of the national strategy for landscape resilience	
(iii) Assistance for the development of ILMPs and MCPs	
(iv) Support for the development of feasibility studies and E&S tools, as needed, for the additional priority basins	
(v) Capacity building and awareness-raising	
<i>Sub-Component 2.2: Project management and sustainability</i>	
(i) Strengthening capacity for day-to-day project management	OGM
(ii) Environmental and social risk management	
(iii) Grievance redress, citizen engagement and communications	
(iv) Monitoring and Evaluation	

## 3. SESA OBJECTIVES and METHODOLOGY

### 3.1. Objectives of SESA

This SESA has been conducted for Çekerek Project Area (CPA) within the scope of TULIP and will help to answer the following questions:

- What are the key environmental and social issues/sensitiveness in CPA?
- Is TULIP relevant to the environmental and social priorities in CPA?
- What are the environmental and social impacts/risks/trade-offs of the planned TULIP investments?
- What are the environmental and social challenges and opportunities to better the implementation of TULIP?
- Is it likely that any sub-project under TULIP will adversely affect the environment or local communities? How can these impacts be mitigated and the sub-projects can be monitored?
- Are there more sustainable and climate-resilient alternatives?
- How can responsible parties prioritize gender sensitivity and ensure that the activities benefit vulnerable groups in implementing TULIP?
- How will environmental and social impacts be managed? What are the responsibilities of the institutions to mitigate or manage these impacts?

### 3.2. Methodology

The SESA methodology is comprised of a series of steps as described below:

#### 3.2.1. Scoping of Environmental and Social Issues

The scoping stage was used for setting the overall frame for the entire SESA work. Thereby, the initial step was to understand the current state in the project area by means of desktop reviews and field visits.

The scoping process supported decision-making on setting the baseline parameters to be focused for impact assessment as well as setting the reference line for future monitoring of project results. Hence the scoping provided a structured method for identifying initial issues related to the Project.

The scoping process has been performed in conjunction with the planning of stakeholder engagement, thus providing concise links between key stakeholders and initial issues.

The field study comprised of on-site observations and consultations (meetings and non-structured interviews) between 22-25 September 2020 with the guidance of Chamber of Forest Engineers (OMO) and OGM.

#### 3.2.2. Identification and Filling of Data Gaps

During the scoping phase of SESA, the initial data obtained through preliminary site visits, stakeholder engagement meetings and literature review were not sufficient to conduct a

reliable strategic environmental and social assessment. Therefore, in the scoping phase, the following data gaps required for the assessment were determined and a gap filling strategy was designed.

**Table 3-1 Gap Analysis and Data Collection Tools**

Issues/Sensitivities	Data Gaps	Data Collection Tools	Geographic Coverage
ENVIRONMENTAL			
Climate	Monthly average temperature data and annual total precipitation data for the relevant stations for the last 20 years and precipitation intensity for 30 minutes	Data from Turkish State Meteorological Services	CPA
Land Cover	Land-use maps	Maps to be collected from OGM	CPA
Floods and landslides	Landslide risk map Flood risk map Topographical map Geology map Map of roads	Risk map to be obtained from OGM Base maps to be obtained from OGM	CPA
Drinking Water	Records of water quality surveys Health records  Coordinates of groundwater wells for drinking water supply; water treatment plants  Wastewater discharge points	Data to be obtained from PDEU and DSI Water-borne disease records from PDH  Information to be obtained from Municipalities (Water and Sewerage Administrations) and DSI  Information to be obtained from Municipalities (Water and Sewerage Administrations) and PDEU	CPA
Soil Contamination	Soil quality measurement results and sampling/measurement points  Nitrate pollution at water resources and soil (NİBİS data)	Directorate General of Water Management	CPA
Erosion	Updated erosion risk map	Risk map to be obtained from AFAD/OGM	CPA
Biodiversity	GIS Layers of HABITAT Maps	Digital GIS Maps to be acquired from OGM and GDNPNP Community Level Questionnaire	CPA

Issues/Sensitivities	Data Gaps	Data Collection Tools	Geographic Coverage
Insufficient Water Supply	Basin hydrology map Location of groundwater wells	Hydrology map to be obtained from DSI	CPA
Environmental Infrastructure	Coverage of sewerage system; water and wastewater treatment plants, landfills.  Solid waste disposal areas (sanitary landfill, closed and existing dump site areas)	Maps and information to be obtained from Municipalities (Water and Sewerage Administrations) and PDEU.  Community Level Questionnaire  Directorate General of Water Management	CPA
<b>SOCIAL</b>			
Outgoing migration	Migration trends of the CPA Causes of migration The impact of Municipal Law No 6360 on " <i>The Establishment of Fourteen Metropolitan Municipalities and Twenty-seven Districts and Amendments at Certain Law and Decree Laws</i> " caused difficulties in terms of gathering data/information through official statistics on the population changes of the villages.	Community Level Questionnaire	Settlement and CPA
Unbalanced population pyramid	Demographic features of the CPA	Community Level Questionnaire	Settlement and CPA
Source of agricultural livelihood	The characteristics of agricultural activities in the CPA. Sources of agriculture related problems of the settlements with different geographical features.	Community Level Questionnaire Household Questionnaire, Official records of TRGM	Settlement and CPA
Structure of employment	Employment structure specific to the CPA	Community Level Questionnaire Household survey	Household, settlement and CPA
Limited economic turnout	Distribution of income according to the settlements in the CPA	Community Level Questionnaire	Settlement and CPA
Low Socio-Economic Status (SES)	Self evaluation of the SES according to muhtars and households Structural features of the houses and economic assets.	Community Level Questionnaire Household Questionnaire	Household, settlement and CPA

Issues/Sensitivities	Data Gaps	Data Collection Tools	Geographic Coverage
Fragmentized land tenure	Livelihood strategies of households. The characteristic of subsidiary livelihoods.	Community Level Questionnaire Household Questionnaire, Official records of TRGM	Household, settlement and CPA
Common properties (forestlands and pasturelands)	Settlement based use of natural resources and relations with the forestry areas.	Community Level Questionnaire	Settlement and CPA
Lack of Infrastructure	Places where infrastructure problems persist.	Community Level Questionnaire, Official records of SPA, KGM and DSI	Settlement and CPA
Community health and safety	Information about prevention and protection in the impacted settlements	Community Level Questionnaire, Records of AFAD	Settlement and CPA
Lack of social facilities and services	Current situation of social services in the CPA. Socio-cultural activity facilities of the settlements.	Community Level Questionnaire	Settlement and CPA
Low educational level	Number of education facilities and level of education in the CPA	Community Level Questionnaire, Household Questionnaire	Household, settlement and CPA
Social exclusion	The sources of tensions between different religious sects and cultures in the CPA Sources of conflict in the local communities.	Community Level Questionnaire	Settlement and CPA
Cultural heritage	Cultural artifacts and intangible cultural heritage that might be impacted by the Project activities	Official correspondence Community Level Questionnaires	Settlement and CPA
<b>Vulnerable Groups</b>			
Disadvantaged Rural Women (handicapped, elderly, refugee, unemployed, migrant worker and female household heads)	Household level information is needed.	Community Level Questionnaire Household Questionnaire	CPA
Women's Access to Basic Services (health and education)	Up-to-date village level information on relevant education and health facilities, conditions of health services, diseases, is needed.	Community Level Questionnaire Household Questionnaire	CPA
Women's Skill Development including Technology Usage	Site – specific data regarding skill level and education needs is needed at household level.	Community Level Questionnaire Household Questionnaire In-depth Interviews	CPA

Issues/Sensitivities	Data Gaps	Data Collection Tools	Geographic Coverage
Women Labour and Time Poverty	Site – specific data regarding time poverty is needed at household level.	Household Questionnaire In – depth Interviews	CPA
Violence Against Women	Qualitative data at household and village level	Community Level Questionnaire In - depth Interviews Key Informant Meeting (Police/Gendarmerie and Yozgat, Sivas, Tokat and Çorum Bars)	CPA
Women’s Access to Infrastructure (water, sanitation and road)	Qualitative data at CPA level	Community Level Questionnaire Household Questionnaire In - depth Interviews Key Informant Meeting (Municipality)	CPA
Women’s Participation in Decision Making Process	Site–specific data regarding women’s participation in decision making process is needed at household level.	In – depth Interviews Key Informant Meeting (Women Civil Society Organizations)	CPA
Gender Division of Labour on Income Resources (Agriculture, livestock, forestry, fisheries and aquaculture)	Up-to-date site-specific data regarding women’s needs, problems, coping strategies in line with their income sources is needed at household level.	Community Level Questionnaire Household Questionnaire In – depth interviews Key Informant Meeting (Extension Agents, Officers (MoFA)	CPA
Women Entrepreneurship	Village level data is needed.	Community Level Questionnaire Household Questionnaire In – depth interviews Key Informant Meeting (KOSGEB)	CPA
Access and Control Over Sources and Land Ownership	Site-specific data is needed.	Community Level Questionnaire Household Questionnaire In – depth interviews Key Informant Meeting (Officers from GD of Land Registry and Cadastre and Bars within CPA)	CPA

Source: CPA SESA Scoping Report, 2021.

Baseline gaps have been eliminated with data from the following sources:

- Baseline characteristics of settlements were determined with Community Level Questionnaires (CLQs).

- Individuals in settlements with different characteristics (settlements with sensitivities) were consulted directly with the Household Questionnaires (HHQs).
- Information about gender issues was obtained through in-deep interviews conducted by gender expert with women.
- Up-to-date and detailed data, which could not be obtained from the literature, were requested from stakeholder institutions and organizations with an official letter. Data gaps and institution-based list of requested data with an official letter are presented in Scoping Report.
- Information about the sensitivities of the region was requested from non-governmental organizations.
- Information, which could not be found in the literature reviews, statistics and is needed to reveal characteristics of agricultural activities, required from required from TRGM, KGM and Provincial Directores of Agriculture and Forest with the official letter from OGM. Please see Annex 2 for the first and second round data request and respond list from government organizations.

### 3.2.3. Stakeholder Engagement

A series of stakeholder engagement techniques have been used throughout the SESA process, from scoping, data collection for establishing the baseline, to setting of key priorities. Participatory actions are described in respective sub-sections.

The first introductory meeting was held in CPA on September 22-25, 2020 with wide stakeholder participation. During the meetings held in the districts, consultations were held with local institution officials and muhtars (See Annex 4 – Çekerek Scoping Field Study programme and participation lists of meetings held during the field study, and Annex 5 for the photolog of the field study). The scoping process was mainly based on the results of these meetings and “Muhtar Short-information Forms” filled by the 78 Muhktars at the end of the meetings on 22-25 September 2020.

A WhatsApp group was established with muhtars of the project settlements on November 04, 2020 before the fieldwork carried out within the scope of Çekerek SESA, and rapid communication was ensured in case of need. Within the scope of SESA, the main problems of the region were identified with a participatory understanding through phone interviews with 177 muhtars. In addition, a total of 267 HHQ implementations were carried out in 48 settlements affected by the project by phone because of Covid-19 restrictions.

During the SESA preparation phase, websites for Çekerek component<sup>7</sup> and TULIP (<https://tulip.ogm.gov.tr/SitePages/OGM/OGMDefault.aspx>) were prepared with the contribution of OGM and OMO officials, and contents regarding the Project information, stakeholder engagement and contact information were provided. Population, livelihood, living

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<sup>7</sup> The webpage established for Çekerek Component has been recently integrated into TULIP’s webpage and a separate webpage for Çekerek Component no longer exists. The project details are available on TULIP’s webpage: <https://tulip.ogm.gov.tr>.

conditions, social life, vulnerable groups, cultural heritage, environmental features and priority issues determined by experts were published on the website and presented for the opinions and suggestions of the stakeholders. In order to enable the stakeholders to actively use the site and participate in stakeholder engagement process, the project websites were introduced to the stakeholders through official letters, telephone messages, and e-mails. These promotions were accompanied by a poster prepared to be displayed in public spaces such as mukhtar offices, mosques.

Between 2-6 November 2020; OGM, DSI, KGM and TRGM officials and staff held online meetings to determine their technical capacities and needs. FAO and WB officials participated as observers in these meetings organized by OMO, and FAO SESA team presented the WB ESS requirements, Environmental and Social Management Framework (ESMF), Stakeholder Engagement Framework (SEF), Resettlement Framework (RF), Labor Management Procedures (LMP) and purchasing procedures.

#### **3.2.4. Prioritization of Key Issues**

The main approach to determine the project priorities has been stemmed from the priorities among the existing problems. For this, the environmental and social problems of the basin were listed and then a participatory approach was adopted to determine their priority order. The following actions have been performed in participatory prioritization of the crucial problems and therefore the areas awaiting investment:

- Priority problems of the settlements were identified through Community Level Surveys (CLQs).
- Individuals in settlements with different characteristics (sensitive settlements) were directly consulted through Household Surveys (HHQs).
- Opinions and suggestions were received from non-governmental organizations on issues that need attention.
- Problems identified in these resources have been reported and summarized for publication on the project website.

As a result of the layered consultations, the priority environmental and social problems of the region were identified. Both environmental and social problems mentioned throughout the consultations have been cross checked through desktop review with the information collected from the implementing authorities and other government organizations.

Regarding environmental issues, mapping and GIS applications have been used with a view to designating ecological hotspots and high risk zones in terms of floods and landslides, that reflect on spatial planning of sub-projects.

#### **3.2.5. Establishment of the Baseline**

The environmental and social (E&S) baseline has been prepared through obtaining the requested information from government organizations and the results of community level and

household level surveys. The baseline refers to E&S parameters that are relevant to the issues scoped in.

The baseline assessment as retrieved from desktop reviews, site observations, interviews and community surveys provide an understanding of the environmental and social context in which the TULIP will achieve restoration, rehabilitation and improvement of the Project Area as necessary.

In this respect, a series of SESA objectives as put forth by TULIP and various regional plans covering the Project Area are used by the SESA Team in order to prioritize concerns and reach a consensus view among stakeholders.

**3.2.6. Preliminary Identification of Key E&S Issues**

The SESA process identifies and assesses key environmental and social challenges and opportunities of better implementation associated with integrated management of the sub-projects developed by different Government Institutions aiming to address issues of a specific landscape.

The preliminary key environmental and social issues/sensitivities in the Project Area identified during the scoping stage are listed below.

**Table 3-2 Key E&S Issues and Sensitivities**

Environmental Issues/Sensitivities	Social Issues/Sensitivities
Air pollution	Outgoing migration
Climate	Total, young and old age dependences
Land cover	Source of agricultural livelihood
Water resources	Structure of employment
Flood risks and landslides	Less developed industry
Soil contamination	Low SES
Erosion	Fragmentized land tenure
Biodiversity	Common Properties (Forestlands and Pasturelands) use issues
Insufficient water supply	Physical resettlement
Solid wastes	Lack of Infrastructure
	Community Health and Safety
	Low educational level
	Social exclusion
	Critical Cultural Areas
	Vulnerable groups
	Gender issues

The key environmental and social issues resulting from the mapping and analytical work are reviewed and prioritized by a representative sample of communities in the critical areas identified from the mapping exercise.

### **3.2.7. Strategic E&S Assessment**

As discussed in Chapter 9, sub-projects have been assessed under 6 rationale topics based on categorization of their inter-linkages within and among them for an integrated understanding.

The categories are assessed with respect to:

- Coordination and integration,
- Relevance to the environmental sensitivities and E&S priorities in the basin,
- Compatibility with social and environmental vulnerabilities,
- Climate resilience effect (if any), and
- Gender sensitivity context.

### **3.2.8. Mitigation Measures**

The SESA Report is concluded with a set of recommendations to mitigate negative impacts that may arise individually or cumulatively during implementation/construction or after implementation/operation phases. Mitigation measures are presented in Section 9.2.

### **3.2.9. Cumulative Impact Assessment**

In addition to an overall assessment of project components under rationale topics, cumulative impacts of planned investments are assessed in Chapter 10. Cumulative Impact Assessment (CIA), based on an approach of “Valued Ecosystem Components” (VECs) defined as environmental and social issues that are considered to be important in assessing risks, and they may be physical features, habitats, wildlife populations, ecosystem services, natural processes, social conditions and cultural aspects. Management approaches for cumulative impacts are presented in Chapter 10 as well.

## 4. LEGAL AND POLICY FRAMEWORK

### 4.1. National Legislation

The key national laws and By-laws presented in this section include the legal context with a broader perspective to basin-wide issues that call for integrated management, sustainability, climate resilience and socio-economic development. The legal frame will be expanded at the stage of impact assessment and development of the management framework in terms of requirements to reduce the potential environmental and social impacts that may arise from the construction and operational activities of sub-projects under TULIP.

One of the key By-laws is the By-law on Strategic Environmental Assessment (SEA By-law hereinafter). It aims at integrating environmental considerations into preparation and approval of plans and programs, which are likely to have significant effects on the environment, with a view to promoting sustainable development. The SEA By-law relates to plans and programs on agriculture, forestry, fishery, energy, industry, transport, waste management, water management, telecommunications, tourism, urban and rural planning or land use and the plans and programs.

The “SEA process” is comprised of a series of stages: screening with respect to Appendix I and II of the By-law; scoping process encompassing a scoping meeting; a public participation meeting (as proportional to the scale of the plan being assessed and as relevant); and assessment process that is based on a review of baseline conditions, identification of issues and possible impacts, designation of environmental protection objectives; assessment of impacts of the plan; associated mitigation measures and monitoring needs; development of alternatives.

The SESA process covers the whole SEA process and exceeds its scope by putting detailed focus on social aspects and conduct of a structured stakeholder engagement process that is beyond public participation.

Considering that Integrated Landscape Management Plans (ILMPs) will be prepared by OGM within TULIP, the screening process should be initiated by OGM by applying to MoEUCC. The SESA process conducted and the SESA Report prepared within the scope of TULIP is anticipated to provide input to and speed up the SEA process under the national legislation.

Under its Article 10, Environmental Law sets out the general scope of the Environmental Impact Assessment (EIA) procedure in Turkey, indicating that institutions, agencies and establishments that lead to environmental problems as a result of their planned activities are obliged to prepare Environmental Impact Assessment report or Project Information File (PIF). Based on this legal framework, the Regulation on Environmental Impact Assessment (henceforth “EIA Regulation”) was put into force for the first time after being published in the Official Journal numbered 21489 and dated on February 7, 1993. Since then, there had been several amendments in the first regulation and new EIA regulations were published in 2008 and 2013 repealing the former regulations in force. The latest EIA Regulation has been published in the Official Journal dated November 25, 2014 and numbered 29186, which repealed the 2013 EIA Regulation.

The EIA Regulation is largely in line with the EU Directive on EIA. The key relevant steps of the Turkish EIA procedure namely screening, public consultation, scoping, disclosure and supervision are briefly reviewed below in the order they are prescribed to occur.

The EIA Regulation classifies projects into two categories:

*Annex I projects.* These are projects that have significant potential impacts and require a full EIA. Annex I of the EIA Regulation lists these project types, so project proponents are expected to start the EIA procedure without any other screening process; and *Annex II projects.* Annex II of the EIA regulation covers projects that may or may not have significant effects on the environment. Proponents of Annex II projects are required to submit a Project Information File (PIF) to the Ministry of Environment, Urbanization and Climate Change (MoEUCC). The PIF is prepared following the General Format for PIF provided in Annex IV of the EIA Regulation and contains information on: (i) project characteristics; (ii) environmental characteristics of the project site and impact area; and (iii) significant impacts of the project and measures to be taken during construction and operation phases of the project. A non-technical summary of the above items is also to be added to the PIF. The PIF is submitted to the MoEUCC for review and evaluation. Provincial Directorate gives its **“EIA is Necessary”** or **“EIA is not necessary”** decision regarding the project. The decision of the Provincial Directorate is communicated to public using appropriate means (i.e. announcement boards, internet).

According to the EIA regulation, it is not needed to prepare an EIA Report for technical assistance works like Component 2.

Table 4-1 provides the list of project types that will be considered for funding under the project and their category per the EIA Regulation. The consideration of social impacts within the screening are not compulsory under the national EIA regulation and generally are either very briefly mentioned or not mentioned at all.

**Table 4-1 National EIA Requirement of Sub-Projects**

Project Components	National EIA Requirement
Component 1: Investments in Resilient Landscape Integration in targeted areas	
Sub-Component 1.1. Green infrastructure and sustainable livelihoods	
(a) Forest landscapes and livelihoods upstream	
(i) Small-scale erosion, landslide, and flood control works upstream	No requirement found, hence, exempt from EIA
(ii) Forest rehabilitation and sustainable management	
(iii) Forest pasture rehabilitation and sustainable management	
(iv) Income generation and livelihood diversification for forest villages	
(b) Sustainable and climate-smart agricultural value chains	

(i) Sustainable and climate-smart agricultural practices	No requirement found, hence, exempt from EIA
(ii) Pasture rehabilitation and sustainable management	
(iii) Agricultural diversification and sustainable value chains for rural villages	
Sub-Component 1.2. Resilient grey infrastructure	
(a) Resilient infrastructure for water security	
(i) Dams and small-scale multipurpose reservoirs	<p><b>Related Clauses:</b></p> <ul style="list-style-type: none"> <li>Annex 1, Clause 14: Projects which has a a <u>reservoir capacity of 10 Millions m<sup>3</sup> or more</u></li> <li>Annex 2, Clause 46: Projects which has a a <u>reservoir capacity of 5 Millions m<sup>3</sup> or more</u></li> </ul> <p><b>Related Projects:</b></p> <ol style="list-style-type: none"> <li>Construction of Ağmuğsa Pond; (does not trigger Annex 1 and Annex 2)</li> <li>Construction of Yukarıhacılı Pond; (does not trigger Annex 1 and Annex 2)</li> </ol>
(ii) Irrigation works	<p><b>Related Clauses:</b></p> <ul style="list-style-type: none"> <li>Annex 1, Projects for transferring water of 10 million m<sup>3</sup>/year and above <u>between river basins</u>, excluding drinking water transportation by pipes</li> <li>Projects for transferring water <u>between river basins</u>, excluding the ones falling under Annex 1</li> </ul> <p><b>Related Projects:</b></p> <ol style="list-style-type: none"> <li>Construction of İbrahimköy Pond Irrigation System (does not trigger Annex 1 and Annex 2)</li> <li>Construction of Seyitnizam Pond Irrigation System (does not trigger Annex 1 and Annex 2)</li> <li>Construction of Kızılhamza Pond Irrigation System (does not trigger Annex 1 and Annex 2)</li> <li>Construction of Artova Pond Irrigation System (does not trigger Annex 1 and Annex 2)</li> <li>Construction of Ağmusa Pond Irrigation System (does not trigger Annex 1 and Annex 2)</li> <li>Construction of Yukarı Karahacılı Pond Irrigation System (does not trigger Annex 1 and Annex 2)</li> <li>Construction of Büyükmahal Pond Irrigation System (does not trigger Annex 1 and Annex 2)</li> </ol>
(iii) Flood and sedimentation control structures	<p><b>Related Clauses:</b></p> <ul style="list-style-type: none"> <li>Projects rehabilitating the river stream for 5 km or more in rivers with continuous flow – Annex 2</li> </ul> <p><b>Related Projects:</b></p> <ol style="list-style-type: none"> <li>Construction of Karalar Village Flood and Debris Control Structure (does not trigger Annex 2)</li> <li>Construction of Karalar Çime Village - Flood and Debris Control Structure (does not trigger Annex 2)</li> <li>Construction of Yeniköy Village-Kurt Stream Flood and Debris Control Structure (does not trigger Annex 2)</li> <li>Construction of Kunduz Village - Karasu Stream Flood and Debris Control Structure (does not trigger Annex 2)</li> <li>Construction of Külekçi Village - Sarsak and Deve Streams Flood and Debris Control Structures (does not trigger Annex 2)</li> </ol>

	<ol style="list-style-type: none"> <li>6. Construction of Arpaç Village - Kavaklı and Hocanınpınar Streams Flood and Debris Control Structures (does not trigger Annex 2)</li> <li>7. Construction of Çandır Village- Kabak and Seynikkızıyunak Streams Flood and Debris Control Structures (does not trigger Annex 2)</li> <li>8. Construction of Çamsaray Village - Kuru Stream Flood and Debris Control Structures (does not trigger Annex 2)</li> <li>9. Construction of Yelten Village -Seyhan Stream and Kirazlı Stream Flood and Debris Control Structures (does not trigger Annex 2)</li> </ol>
Component 2: Institutional Framework, Project Management, and Sustainability (National EIA Regulation is not applicable to the activities within the scope of this component)	

Laws and regulations that pertain to the E&S issues of the Project are given in Tables 4.2 through 4.4 below.

**Table 4-2 Primary National Legislation**

Title of Legislation and Date/Issue of Official Journal	Brief context
<b>Environment</b>	
Environmental Law No. 2872 (16.08.1983/18132)	The framework law for environmental legislation (and penalties). Overall environmental protection.
Forest Law No. 6831 (08.09.1956/9402)	Regulates the protection and conservation of forests, including topics such as rights of forest villagers, tourism, water management, the forests under protection, natural parks, non-wood products, public consciousness, grasslands and financial supports given to the villagers.
Law on Groundwater No:167	Regulates use of groundwater. State Hydraulic Works (DSI) is the competent authority for groundwater exploration, and construction and operation of wells to be utilized by facilities for groundwater extraction purposes.
<b>Ecosystem Services</b>	
Pasture Law No. 4342 (as amended with the Law No. 6552 and relevant regulations)	The purpose of this law is to ensure that pastures are used in accordance with the rules to be determined, to increase and maintain their productivity by maintaining and improving them, to constantly monitor their use, to protect and to change the purpose of use if it is necessary. Stipulates that in-forest pastures and graze lands are re-defined by a committee and cannot be used for any other purposes unless their allocation purposes are modified.
Agricultural Law No. 5488 (18.04.2066/ 26149)	The aim of this Law determining the necessary policies and making arrangements for the development and support of the agricultural sector and rural area in line with the development plans and strategies. Sets the necessary policies and regulates development and support of the agricultural sector and rural areas in line with the development plans and strategies.
Soil Protection and Land Use Law No:5403 (19.07.2005/25880)	The purpose of this Law; protection of land, development, classification of agricultural lands, determination of minimum agricultural land and sufficient income agricultural land sizes and prevention of their fragmentation, determination of principles to ensure planned use of agricultural land and sufficient income agricultural lands in accordance with environmental priority sustainable development principle.

Title of Legislation and Date/Issue of Official Journal	Brief context
<b>Expropriation</b>	
Expropriation Law No: 2942 (08.11.1983 / 18215)	Expropriation law is defined by expropriation process which is performed legitimately under the 46. Article of constitution and provisions of the law. Government and statutory bodies are authorized to expropriate and establish an easement on personal property partially or fully, in condition of pay cash its market value, in such cases when public welfare requires and in compliance with the principles and procedures stated in laws.
Amendment on Expropriation Law (05.05.2011 / 24393)	The amendments of the Expropriation Law shortly stipulates that the party who expropriate is also entitled to apply to the court for determination of price. In this case, the party whose property is expropriated should pursue the lawsuit and claim his/her rights to determine market value of his/her property.
<b>Stakeholder Engagement</b>	
Constitution of Republic of Turkey	Constitution of Republic of Turkey is the fundamental document in respect to guaranteeing citizens' freedom of thought and opinion. According to Article 26 of the Constitution, "Everyone has the right to express and disseminate his/her thoughts and opinions individually or collectively, through speech, writing, painting or other means".
Law on the Right to Information No.4982 (Official Gazette dated 24.10.2003 and numbered 25269)	Law on the Right to Information defines the process concerning the right to information. It regulates this right in line with the principles of equality, impartiality and transparency, which are the prerequisites of democratic and transparent administration.
The Law on Use of the Right of Petition (Official Gazette dated 01.11.1984 and numbered 3071)	Citizens of the Turkish Republic are entitled to apply to the Turkish Grand National Assembly and the public authorities by written petition.
<b>Labor</b>	
Occupational Health and Safety Law (Official Gazette dated 20.06.2012 and numbered 6331)	Object of this law is to regulate duties, authority, responsibility, rights and obligations of employers and workers in order to ensure occupational health and safety at workplaces and to improve existing health and safety conditions.
Labor Law (Official Gazette dated 22.05.2003 and numbered 4857)	Working conditions and work-related rights and obligations of employers and employees working under an employment contract are regulated by this law.
Labor Law (Official Gazette dated 22.05.2003 and numbered 4857)- Article 71	It is prohibited to employ children who have not completed the age of 15. However, children who have completed the age of 14 and have completed compulsory primary school period can be employed in light works.
Social Insurance and General Health Insurance Law (No.5510) (16.06.2006 / 26200)	Determines the rights of beneficiaries and provides for general rules for the functioning of the insurance system and funding conditions. Also contains provisions on employers and workplaces, short-term and long-term insurances.
Primary Education and Training Law (Official Gazette dated 12.01.1961 and numbered 222)- Article 59	Those who do not attend compulsory primary education institutions cannot be employed (for a fee or for free) in any official and private workplaces. Those who document that they attend primary education institutions can be employed in such places except for the lecture hours

Title of Legislation and Date/Issue of Official Journal	Brief context
	provided that the provisions of the law regulating the employment of children are applied.
Child Protection Law (Official Gazette dated 15.07.2005 and numbered 5395)	The basic principles for the protection of the child rights are explained.
Public Health Law (Official Gazette dated 06.05.1930 and numbered 1593)-Article 173	Employment of all children under the age of 12 as labor and apprentice in all kinds of businesses, such as factories, workshops, mines is prohibited.
Vocational Training Law (Official Gazette dated 19.06.1986 and numbered 3308)-Article 13	Includes regulations on the development of knowledge and skills in the context of child labor starting at the age of 14
Restructuring of Some Receivables and Social Insurance and General Health Insurance Law (Official Gazette dated 25.02.2011 and numbered 6111)-Article 51	Discontinuous workers in agriculture and forestry sectors will work with insurance and their insurance will be evaluated within the scope of 4 / a at the same law. Agricultural workers under this insurance have been given the opportunity to benefit from work accident, occupational disease, disability, old age, death insurance and general health insurance.
<b>Cultural Heritage</b>	
Law on Conservation of Cultural and Natural Assets No. 5879 (Official Gazette dated 21.7.1983 and numbered 18113)	The purpose of this Law is to determine the definitions related to movable and immovable cultural and natural assets that need to be protected, to organize the transactions and activities to be carried out, to determine the establishment and duties of the organization that will take the necessary principles and implementation decisions in this regard.
<b>Gender</b>	
Civil Law (Official Gazette dated 01.01.2002 and numbered 24607)	The law upholds equality between women and men, puts an end to sexual discrimination, renders women equal to men in both family and the society; and values the women's work. With the new Civil Code, substantial changes were made considering the developments in the law of domestic relations, and the changes and needs of the day.
Penal Law no: 5237 (Official Gazette dated 01.06.2005 and numbered 25611)	Include modern arrangements with respect to gender equality and domestic violence against women.
<b>Other</b>	
Highways Traffic Law Official Newspaper Date : 18.10.1983   Numbered 18195	Measures to be taken to ensure traffic order regarding safety of life and goods and all issues relating to traffic safety

**Table 4-3 Secondary National Legislation**

Title of By-law	Date of Official Journal	Issue	Implications for the Project
ENVIRONMENT			
Air Quality and Management			
By-law Concerning Follow up of Greenhouse Gas Emissions	May 31, 2017	30082	GHG emissions mainly from transportation vehicles during construction works
By-law on the Control of Exhaust Emissions	March 11, 2017	30004	Exhaust gas emissions from transportation vehicles
Industrial Air Pollution Control By-law	December 20, 2014	29211	Management of air emission sources during construction and operation stages. Dust emission control at the construction stage and SO <sub>2</sub> , NO <sub>x</sub> and dust emission control at the operation stage Emission monitoring
By-law on Assessment and Management of Air Quality	June 6, 2008	26898	Management of ambient air quality. Ambient air quality standards Modelling Requirement
Environmental Management, Permitting and Planning			
By-law on Environmental Impact Assessment	November 25, 2014	29186	Annex II project introduction files to be prepared for the water reservoirs.
By-law on Strategic Environmental Assessment	April 08, 2017	30032	Preparation of ILMPs may trigger preparation of a SEA Report in the future.
By-law on Environmental Permit and Licenses	September 10, 2014	29115	Operation of new establishments and facilities
Regulation on Amendments to the Environmental Permit and Licensing Regulations	December 12, 2020	31351	Operation of new establishments and facilities
By-law on Preparation, Implementation and Monitoring of Basin Management Plans	October 17, 2012	28444	Environmental requirements in case of preparing ILMPs
By-law for Starting up and Operating a Work Place	August 10, 2005	25902	Operation of the facilities.
By-law on Environmental Auditing	November 21, 2008	27061	All types of polluting activities and violations are subject to auditing throughout their life time.
Nature Protection			
By-law Procedures and Principles Concerning the Determination, Registration and Approval of Protected Areas	July 19, 2012	28358	Critical habitats among protected areas
By-law on Pastures	July 31, 1998	23419	Protection and restoration of pastures
By-law on the Protection of Wetlands	April 4, 2014	28962	Protection requirements for wetlands in the basin

By-law on Activities for Supporting Improvement of Forest Villagers	June 13, 2012	28322	Income generation, health and safety, vulnerability of forest villagers
By-law on Procedures and Principles Concerning the Protection of Game and Wild Animals and their Habitats and Combat with their Pests	October 24, 2005	25976	Prevention of illegal hunting in the project area
Noise Control and Management			
By-law on the Assessment and Management of Environmental Noise	June 4, 2010	27601	Control of environmental noise from construction and operation of certain sub-project activities
By-law on the Environmental Noise Generation caused by Equipment used Outdoors	June 30, 2016	29758	Control of environmental noise from construction and operation of certain sub-project activities
Soil Quality Control and Management			
Implementation By-law on Soil Protection and Land Use	December 15, 2005	26024	Protection of agricultural lands.
By-law on the Control of Soil Pollution and Polluted Areas by Point Sources	June 8, 2010	27605	Risks of point sources of soil contamination from sub-project activities
Waste Management			
By-law of Waste Management	April 2, 2015	29314	Management and disposal of wastes generated during the construction and operation stages Management of hazardous wastes
By-law Concerning the Landfill of Wastes	March 26, 2010	27533	Final disposal of wastes in sanitary landfills
By-law on the Control of Excavation Materials, Construction and Demolition Wastes	March 18, 2004	25406	Disposal of excavation materials and construction debris at appropriate areas to be designated by the municipality
By-law on the Control of Medical Wastes	January 25, 2017	29959	Separate storage, collection and disposal of medical wastes
By-law on the Control of Packaging Wastes	December 27, 2017	30283	Separate storage, collection and disposal of packaging waste
By-law on the Control of Waste Batteries and Accumulators	August 31, 2004	25569	Separate storage, collection and disposal of waste batteries and accumulators
By-law on the Control of Waste Oils	July 30, 2008	26952	Management of waste oils generated at construction and operation stages
Zero Waste By-law	July 12, 2019	30829	Sorting and recycling of wastes
By-law on the Control of Waste Tires	March 11, 2015	29292	Separate storage, collection and disposal of waste tyres
Waste Quality Control and Management			

Ordinance on Groundwater Resources	August 8, 1961	10875	Protection of groundwater resources
By-law Concerning Protection of Ground Waters against Pollution and Deterioration	May 22, 2015	29363	Protection of groundwater resources
By-law Concerning Quality of Surface Waters Planned or Used as Drinking Water Supply	June 29, 2012	28338	Licensing of groundwater supply by DSI
By-law Concerning Water for Human Consumption	March 7, 2013	28580	Drinking water supply
By-law on Cesspits Where Sewer System Construction is not Applicable	March 19, 1971	13783	Wastewater management in rural settlements
Surface Water Quality Management By-law	April 15, 2015	29327	Requirements to mitigate pollution of surface waters
By-Law on Determination of Sensitive Water Bodies with Areas Affecting these Water Bodies and Improvement of Water Quality	December 23, 2016	29927	Prevention of agricultural pollution in nitrate sensitive water bodies.
Urban Wastewater Treatment By-law	January 8, 2006	26047	Requirements for collection, treatment and discharge of urban wastewater.
By-law Concerning Wastewater Collection and Discharge Systems	January 6, 2017	29940	Requirements for planning, design, construction and operation of wastewater collection and discharge systems.
Water Pollution Control By-law	December 31, 2004	25687	Water quality discharge limits
HEALTH, SAFETY AND LABOR			
Health and Safety			
Communiqué on Hazard Classes List related to Occupational Health and Safety	December 26, 2012	28509	OHS risk classification in sub-projects
First Aid By-law	July 29, 2015	29429	Requirements as part of OHS management
Heavy and Dangerous Works By-law	June 16, 2004	25494	Requirements as part of OHS management
Health and Safety Signs By-law (based on EU Council Directive 92/58/EEC dated June 24, 1992)	September 11, 2013	28762	Requirements as part of OHS management
By-law Concerning the Use of Personal Protection Equipment at Workplaces (based on EU Council Directive 89/656/EEC dated November 11, 1989)	July 2, 2013	28695	Requirements as part of OHS management
By-law on Health and Safety in Fixed Term and Temporary Employment	August 23, 2013	28744	Requirements as part of OHS management
By-law on Health and Safety Measures in the Use of Work Equipment	April 25, 2013	28628	Requirements as part of OHS management
By-law on Health and Safety Measures to be taken at Works Involving Chemical Substances	August 12, 2013	28733	Requirements as part of OHS management
By-law on Methods and Essentials of Occupational Health and Safety Training for Workers	May 15, 2013	28648	Requirements as part of OHS management

By-law on Occupational Health and Safety (based on EU Council Directive 89/391/EEC dated June 6, 1989)	December 9, 2003	25311	Requirements as part of OHS management
By-law on Radiation Safety	March 24, 2000	23999	Requirements as part of OHS management
Communiqué on Vocational Training Of Workers To Be Worked In Heavy And Dangerous Works	May 31, 2009	27244	Requirements as part of OHS management
By-law On Duty, Authority, Responsibility and Training of Occupational Safety Experts	December 29, 2012	28512	Requirements as part of OHS management
By-law On Duty, Authority, Responsibility and Training of Workplace Doctors	July 20, 2013	28713	Requirements as part of OHS management
By-law On Occupational Health and Safety Risk Assessment	December 29, 2012	28512	Requirements as part of OHS management
By-law on Protection of Buildings from Fire	December 19, 2007	26735	Requirements as part of OHS management
By-law on Electricity Indoor Facilities	November 4, 1984	18565	Requirements as part of OHS management
By-law on Occupational Health and Safety in Construction Works	October 5, 2013	28786	Requirements as part of OHS management
By-law on Control of Large-Scale Industrial Accidents	August 18, 2010	27676	Community risks associated with storage of hazardous chemicals
<b>Labor</b>			
By-law on the Procedures and Principles of Employing Child and Young Workers	April 6 2004	25425	Requirements as part of Labour Management Procedures
By-law on the Conditions of Women Employees Working In Night Shifts	July 24, 2013	28717	Requirements as part of Labour Management Procedures
By-law on the Working Conditions of Pregnant or Nursing Women and Nursing Rooms and Child Care Residences	August 16, 2013	28737	Requirements as part of Labour Management Procedures
By-law on Work Permits of Foreigners Provided With Temporary Protection (Article 5)	January 15, 2016	29594	Requirements as part of Labour Management Procedures
By-law on the Special Procedures and Principles Regarding Works in Shifts Conducted by Workers	April 7, 2004	25426	Requirements as part of Labour Management Procedures
By-law on Contractors and Sub-contractors	27 September 2008	27010	Requirements as part of Labour Management Procedures
Prime Ministry Circular (Articles 5 and 7)	2017	6	Requirements as part of Labour Management Procedures

**Table 4-4 Non-Exhaustive List of Social Legal Framework Applicable**

Title of By-law	Date of Official Journal	Issue
Labor Law (No. 4857)	10 June 2003	25134
Law on Occupational Health and Safety (No. 6331)	30 June 2012	28339

By-law on Contractors and Sub-contractors	27 September 2008	27010
Laws on Right to Information (No. 4982)	24 October 2003	25269
Expropriation Law	8 November 1983	18215
Amendment on Expropriation Law	5 May 2011	24393
By-law on Environmental Impact Assessment	November 25, 2014	29186

## 4.2. National and Regional Policy Frame

National policy documents, strategies and action plans relevant to the project are presented below.

**Table 4-5 Applicable National Policies, Strategies and Action Plans**

Policy Document	Period	Responsible Organization
11th National Development Plan	2019-2023	Presidency's Strategy and Budget Office
National Climate Change Strategy (NCCS)	2010-2023	Ministry of Environment, Urbanization and Climate Change
National Climate Change Action Plan (NCCAP)	2011-2023	Ministry of Environment, Urbanization and Climate Change
National Climate Change Adaptation Strategy and Action Plan	2011-2023	Ministry of Environment, Urbanization and Climate Change
The Strategic Plan of the Ministry of Energy and Natural Resources (MENR)	2015-2019	Ministry of Energy and Natural Resources
Wastewater Treatment Action Plan	2015-2023	Ministry of Environment, Urbanization and Climate Change
Strategic Plan of Ministry of Environment, Urbanization and Climate Change	2015-2017	Ministry of Environment, Urbanization and Climate Change
Food Agriculture and Livestock Strategic Plan(s)	2018-2022	Ministry of Agriculture and Forestry
National Agricultural Drought Strategy and Action Plan (NADSAP)	2013-2017	Ministry of Agriculture and Forestry
Integrated Urban Development Strategy and Action Plan	2010-2023	Ministry of Environment, Urbanization and Climate Change
National Basin Management Strategy	2014-2023	Ministry of Agriculture and Forestry
National Biodiversity Strategy and Action Plan	2007	General Directorate of Nature Conservation and National Parks
National Disaster Management Strategic Plan	2013-2017	Ministry of Interior, Disaster and Emergency Preparedness Presidency (AFAD)
National Wetland Strategy and Action Plan	2011-2015	Ministry of Agriculture and Forestry
National Programme on The Elimination of Child Labour	2017-2023	Ministry of Family and Social Services
The National Employment Strategy of Turkey	2014-2023	Ministry of Family and Social Services

In addition to the above-mentioned national policy documents, regional plans are also key for the assessment of E&S issues in Project Area, as listed in Table 4-6.

**Table 4-6 Applicable Regional Policies and Action Plans**

Policy Document	Period	Responsible Organization
Yeşilırmak Basin Master Plan	2016	Former Ministry of Forestry and Water Affairs
Yeşilırmak River Basin Management Plan Strategic Environmental Assessment	2021	Ministry of Environment, Urbanization and Climate Change
Eastern Black Sea River Basin Protection Plan	2013	Ministry of Agriculture and Forestry
Kızılırmak Basin Protection Action Plan	-	Ministry of Agriculture and Forestry
Yeşilırmak Basin Protection Action Plan	-	Ministry of Agriculture and Forestry
11th Rural Development Plan	2019-2023	President's Strategy and Budget Office
Samsun-Çorum-Tokat Planning Region 1/100000 scaled Environmental Plan	N/A <sup>8</sup>	Ministry of Environment, Urbanization and Climate Change
Yozgat-Sivas-Kayseri Planning Region 1/100000 scaled Environmental Plan	N/A	Ministry of Environment, Urbanization and Climate Change

### 4.3. International Agreements and Conventions

Turkish national policy on protection of environment, cultural heritage and conservation of biological resources has been formulated on the basis of relevant international agreements signed or ratified by Turkey. Relevant environmental, OHS and international labor agreements and conventions ratified by Turkey are listed below:

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (ratified on 22.03.1989)
- Bern Convention on Protection of Europe's Wildlife and Living Environment (ratified on 24.12.1979)
- Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) (ratified on 20.06.1996)
- Convention on Long-range Transboundary Air Pollution (ratified on 13.11.1979)
- European Convention on the Protection of the Archaeological Heritage (ratified on 29.11.1999)
- European Landscape Convention (ratified on 01.08.2018)
- International Convention for the Protection of Birds (ratified on 14.06.1967)
- Montreal Protocol on Substances that Deplete the Ozone Layer (ratified on 20.09.1991)
- Paris Convention on the Protection of the World Cultural and Natural Heritage (ratified on 16.03.1983)

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<sup>8</sup> Not Applicable: Environmental plans do not have a specific period. They are documents that are updated as needed.

- Ramsar Convention on Wetlands of International Importance Especially as Wildfowl Habitat (ratified on 13.11.1994)
- Stockholm Convention on Persistent Organic Pollutants (ratified on 30.07.2009)
- United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (ratified on 16.05.1998)
- United Nations (UN) Framework Convention on Climate Change (Kyoto Protocol) (ratified on 28 May 2009)
- UN (Rio) Convention on Biological Diversity (ratified on 11.06.1992)
- Vienna Convention on the Protection of the Ozone Layer (ratified on 20.09.1991)
- ILO Occupational Safety and Health Convention (ratified on 03.02.2004)
- Occupational Health Services Convention (ratified on 03.02.2004)
- Labour Inspection Convention (ratified in 1947)
- Promotional Framework for Occupational Safety and Health Convention (ratified on 15.06.2006)
- Worst Forms of Child Labour Convention (ratified on 25.01.2001)
- Convention Concerning the Protection of the World Cultural and Natural Heritage: World Heritage Convention
- Cartagena Protocol on Biosafety to the Convention on Biological Diversity
- United Nations International Governmental Platform on Biodiversity and Ecosystem Services (IPBES)

#### 4.4. World Bank Standards

The World Bank (WB) is committed to supporting Borrowers in the development and implementation of projects that are environmentally and socially sustainable, and to enhancing the capacity of Borrowers' environmental and social frameworks to assess and manage the environmental and social risks and impacts of projects. To this end, the Bank has defined specific Environmental and Social Standards (ESSs), which are designed to avoid, minimize, reduce or mitigate the adverse environmental and social risks and impacts of projects. The Bank will assist Borrowers in their application of the ESSs to projects supported through Investment Project Financing in accordance with this Environmental and Social Policy for Investment Project Financing (Policy). Brief description of the WB ESSs relevant to the project are given in Table 4-7.

After enactment of the Environmental and Social Framework (ESF), environmental and social safeguard policies of the World Bank got abolished, but some remained in force. One of them is *OP 7.50 - Projects on International Waterways*. It describes the types of waterways and projects that the policy applies, and the requirements and conditions of financing projects on international waterways. With regard to OP 7.50, the sub-projects financed are located and dependent on national waterways only. The waterways identified as NOT being international waterway (do not trigger OP 7.50) in Turkey are the following: Susurluk, North Aegean, Gediz, Küçük Menderes, Büyük Menderes, Western Mediterranean, Antalya, Sakarya, Western Black Sea, Yeşilirmak, Kızılırmak, Konya Kapalı, Eastern Mediterranean, Seyhan, Ceyhan, Eastern

Black Sea, Burdur, Afyon, Orta, Anadolu, and Van. As the Project Area is one of the sub-basins of the Yeşilirmak Basin, the Project does not trigger OP 7.50.

The other safeguard policy still in force is OP 7.60 – Projects in Disputed Areas and it is not triggered by the Project, as the Project area is not located in any disputed area.

**Table 4-7 Brief Description of World Bank ESSs Relevant to the Project**

ESS No.	Topic	Brief requirement
ESS 1	Assessment and Management of Environmental and Social Risks and Impacts	The Borrower will carry out an environmental and social assessment of the project to assess the environmental and social risks and impacts of the project throughout the project life cycle. The assessment will be proportionate to the potential risks and impacts of the project, and will assess, in an integrated way, all relevant direct, indirect and cumulative environmental and social risks and impacts throughout the project life cycle, including those specifically identified in ESSs 2–10.
ESS 2	Labor and Working Conditions	The Borrower will develop and implement written labor management procedures applicable to the project. These procedures will set out the way in which project workers will be managed, in accordance with the requirements of national law and this ESS.
ESS 3	Resource Efficiency and Pollution Prevention and Management	The Borrower will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention measures in accordance with the mitigation hierarchy. The measures will be proportionate to the risks and impacts associated with the project and consistent with Good International Industry Practice, in the first instance the WB Environmental, Health and Safety Guidelines.
ESS 4	Community Health and Safety  Annex 1 – Safety of Dams	The Borrower will evaluate the risks and impacts of the project on the health and safety of the affected communities during the project life cycle, including those who, because of their particular circumstances, may be vulnerable. The Borrower will identify risks and impacts and propose mitigation measures in accordance with the mitigation hierarchy.  Annex 1 to ESS4 requires that the Borrower engages experienced and competent professionals for the supervision of the design and construction of new dams and require the owner of the dam to adopt and implement dam safety measures during the design, bid tendering, construction, operation, and maintenance of the dam and associated works.
ESS 5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	The Borrower will demonstrate that involuntary land acquisition or restrictions on land use are limited to direct project requirements for clearly specified project purposes within a clearly specified period of time. The Borrower will consider feasible alternative project designs to avoid or minimize land acquisition or restrictions on land use, especially where this would result in physical or economic displacement, while balancing environmental, social, and financial costs and benefits, and paying particular attention to gender impacts and impacts on the poor and vulnerable.
ESS 6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	The environmental and social assessment as set out in ESS1 will consider direct, indirect and cumulative project-related impacts on habitats and the biodiversity they support. This assessment will consider threats to biodiversity, for example habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, pollution and incidental take, as well as projected climate change impacts. It will determine the significance of biodiversity or habitats based on their vulnerability and irreplaceability at a global, regional or national level and will also take into account the differing values attached to biodiversity and habitats by project-affected parties and other interested parties.

ESS 8	Cultural Heritage	The Borrower will avoid impacts on cultural heritage. When avoidance of impacts is not possible, the Borrower will identify and implement measures to address impacts on cultural heritage in accordance with the mitigation hierarchy. Where appropriate, the Borrower will develop a Cultural Heritage Management Plan.
ESS 10	Stakeholder Engagement and Information Disclosure	Borrowers will engage with stakeholders throughout the project life cycle, commencing such engagement as early as possible in the project development process and in a timeframe that enables meaningful consultations with stakeholders on project design. The nature, scope and frequency of stakeholder engagement will be proportionate to the nature and scale of the project and its potential risks and impacts.

In accordance with the ESSs, the World Bank Group's Environment, Health and Safety (EHS) Guidelines should be applied to the project. Therefore, this project will apply the relevant requirements of the EHS Guidelines. In cases where the Turkish requirements differ from the levels and measures presented in the EHS Guidelines, the more stringent one (such as the most stringent discharge and emission standards) will be applied in the project specifications.

The applicable WBG EHS Guidelines for TULIP, depending on the specific type of sub-projects, include but are not limited to the following:

- World Bank Group's EHS General Guidelines (2007)
- World Bank Group's EHS Guidelines for Water and Sanitation (2007)
- World Bank Group's EHS Guidelines for Waste Management Facilities (2007)
- World Bank Group's EHS Guidelines for Forest Harvesting Facilities (2007)
- World Bank Group's EHS Guidelines for Annual Crop Production (2016)
- World Bank Group's EHS Guidelines for Perennial Crop Production (2016)
- World Bank Group's EHS Guidelines for Mammalian Livestock Production (2007)
- World Bank Group's EHS Guidelines for Construction Materials Extraction (2007)

Given the importance of the Covid-19 pandemic, World Bank Group (WBG) also provided guidance as follows;

- Technical Note: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings, issued on March 20, 2020
- Technical Note: Use of Military Forces to Assist in Covid-19 Operations, issued on March 25, 2020
- ESF/Safeguards Interim Note: Covid-19 Considerations in Construction/Civil Works Projects, issued on April 7, 2020
- Technical Note on SEA/H for HNP Covid Response Operations, issued in March 2020
- Interim Advice for IFC Clients on Preventing and Managing Health Risks of Covid-19 in the Workplace, issued on April 6, 2020
- Interim Advice for IFC Clients on Supporting Workers in the Context of Covid-19, issued on April 6, 2020

- IFC Tip Sheet for Company Leadership on Crisis Response: Facing the Covid-19 Pandemic, issued on April 6, 2020

WHO resources also include technical guidance on: (i) laboratory biosafety, (ii) infection prevention and control, (iii) rights, roles and responsibilities of health workers, including key considerations for occupational safety and health, (iv) water, sanitation, hygiene and waste management, (v) quarantine of individuals, (vi) rational use of PPE, (vii) oxygen sources and distribution for Covid-19 treatment centers (see WHO website for Country and Technical Guidance on Covid-19<sup>9</sup><https://www.who.int/emergencies/diseases/novel-coronavirus-2019>).

#### 4.5. Legislative Gap Analysis

There are a number of differences between the Turkish EIA Regulation and the WB impact assessment procedures. Major differences are related with categorization, scope of environmental and social assessment, and public consultation. Table 4-8 provides a summary of the major differences.

**Table 4-8 Differences between Turkish and WB Impact Assessment Procedures**

Topic	World Bank Standards	National Regulation
Project categorization	Projects are classified into one of four classifications as High Risk, Substantial Risk, Moderate Risk or Low Risk considering relevant potential risks and impacts, such as the type, location, sensitivity and scale of the project; the nature and magnitude of the potential E&S risks and impacts; the capacity and commitment of the Borrower; and other areas of risks that may be relevant to the delivery of E&S mitigation measures and outcomes. Projects are screened on a case-by-case basis.	Projects are classified into two categories as Annex I and Annex II projects, which is mainly based on magnitude of capacity of planned investment, rather than associated risks and impacts. Projects are screened with respect to Annex I and Annex II of the EIA Regulation.
Scope of Assessment	Level of assessment varies with respect to significance of potential risks and impacts. All direct, indirect and cumulative environmental and social risks and impacts are assessed.	Assessment is made based on an outline of contents provided by MoEUCC, which is comprised of estimation of mainly direct environmental impacts. Indirect and cumulative impacts are not considered in general. Level of detail on social baseline and assessment of social impacts is limited. There is usually limited focus on community health and safety and occupational health and safety and labor and working conditions. No concerns on disadvantaged or vulnerable and gender related issues.

<sup>9</sup> <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

Topic	World Bank Standards	National Regulation
Stakeholder engagement	An integral part of E&S assessment Is conducted in accordance with ESS 10. Continuous stakeholder engagement takes place throughout the life cycle of the project (proportionate to the nature, scale and impact magnitude of the project)	The Turkish EIA Regulation requires “pre-scoping” public consultation only for projects requiring an EIA, and only requires announcement of the environmental assessment together with the justification.

Table 4-9 provides a brief summary of key gaps between WB ESSs and Turkish E&S legislation.

**Table 4-9 Key Gaps Between WB ESSs and Turkish E&S Legislation**

WB ESSs	Gaps	ESF Documents/study to fill the Gaps
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	<p>The major gaps between National EIA Regulation and ESS 1 are as follows:</p> <ul style="list-style-type: none"> <li>• Social impact assessment is not completely integrated to the Turkish EIA and this results in the absence of proper social baseline, identification and assessment of the project induced social impacts including impacts on disadvantaged or vulnerable and gender related issues,</li> <li>• The absence of an executive summary and information on the legal and institutional framework in the Turkish EIA (Technical level of information in the non-technical summary required in the Turkish EIA may not meet WB requirements);</li> <li>• Limited or no requirement to cover cumulative impacts with other projects in the Turkish EIA;</li> <li>• Limited emphasis on the associated facilities;</li> <li>• Limited information regarding sub-management plans such as Water Quality Management Plan, Air Quality Management Plan, Noise Management Plan, Hazardous Waste Management Plan, Community Health and Safety Management Plan etc.</li> </ul>	<p>Sub-project specific environmental and social assessment studies regarding Environmental and Social Impact Assessment (ESIA) or Environmental and Social Management Plan (ESMP) will be prepared in line with ESS1. In this respect, potential social impacts of the sub-projects will be the part of the assessment.</p> <p>The environmental and social assessment will include impacts of the associated facilities and potential cumulative impacts.</p> <p>Depending on the level of the impacts and proposed mitigation measures together with residual impact analysis, sub-management plans will be annexed to each ESIA/ESMP.</p>
ESS 2: Labour and Working Conditions	<p>In general, Turkish national laws and regulations regarding labour and working conditions satisfies ESS 2 requirements. Worker grievance mechanism is the main gap between national legislative requirement and ESS 2. Per the Turkish national legislation on labour and working conditions, there is no specific requirement related to grievance mechanism that allow workers to communicate their complaints to the employer.</p>	<p>Labour Management Procedures (LMP) is a component of the ESF instruments. LMP provides guidance on the required mitigations or management implementations such as workers GM, code of conduct etc. stipulated by ESS2 and relevant WB EHS guidelines.</p> <p>In line with the LMP, LM Plans will be developed for the sub-projects, as relevant.</p>

WB ESSs	Gaps	ESF Documents/study to fill the Gaps
ESS 3: Resource Efficiency and Pollution Prevention and Management	<p>Most of the relevant national legislations regarding laws and regulations are in line with EU directives. There is no major gap between ESS3 and legislative requirements. Local EIA does not provide detailed management perspective on potential impacts, mitigation measures and residual impacts and monitoring. In other words, sub-management plans are not specifically defined in local EIA process.</p> <p>Additionally, the specific studies regarding resource use and pollution prevention such as Water Source Vulnerability Analysis (WSVA), Green House Gas (GHG) estimations etc. are not included in local EIA Process.</p>	<p>Sub-management plans will be developed as part of ESIA/ESMP, for construction and operation phases of the projects. These management plans will also provide requirement stipulated in relevant WB EHS Guidelines.</p>
ESS 4: Community Health and Safety	<p>In general, there is no gap in terms of policy level. On the other hand, project level management of specific risks such as labour influx, sexual exploitation and abuse and sexual harassment are the key gaps in terms of ESS4.</p> <p>In relation to dam safety; despite that there is no specific legislation for dam classification and their required safety measures are available but the general requirements are identified following many laws and regulations, such as Protection against Flooding Law (1943), Civil Defence Act (1958), Measures and Assistance Regarding Natural Disasters affecting General Public Life Precautions Act (1959), DSI Regulation on Protection against Flooding (1982), The Environmental Law (1983), and Regulation on the Environmental Impact Assessment (2003).</p> <p>In order to eliminate the security weaknesses that may occur during the operation of water storage structures, DSI has in place guidelines "Environmental Protection, Safety and Warning Systems" for Power Generation Facilities". In line with this guide, for each storage structure, operation DSI prepares an "Environmental Protection, Safety and Warning Systems Application Project" that includes safety measures against possible risks associated with construction and operation activities in storage structures.</p>	<p>Management plans will be prepared for the sub-projects, as relevant, as a part of ESIA/ESMP, such as:</p> <ul style="list-style-type: none"> <li>• Traffic Management Plans,</li> <li>• Community Health and Safety Plans,</li> <li>• Emergency Response and Preparedness Plans</li> </ul> <p>DSI will comply with the dam safety requirements of the WB by means of conducting risk assessment procedures and preparing and implementing Emergency Preparedness Plans; conducting monitoring and reporting procedures, ensuring reviews by an independent panel of experts throughout investigation, design, and construction of the dam and the start of operations, preparation and implementation of detailed plans for construction supervision and quality assurance, a plan for instrumentation, an operation and maintenance plan, and an emergency preparedness plan; prequalification of bidders during procurement and bid tendering; and periodic safety inspections of the storage structures and dams after completion.</p> <p>The ESMP/LMP will include relevant provisions for sexual exploitation, abuse and sexual harassment, Covid-19 and any other potential communicable disease.</p>
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	<p>Turkish legislation on land acquisition mainly corresponds to requirements stipulated by ESS 5. However some differences include; preparation of a Resettlement Plan (RP), compensation at replacement costs, continuous consultation during RP implementation, impact assessment on informal land users, vulnerable groups and land based livelihood restoration are the major gaps in terms of ESS 5 requirement.</p>	<p>The Resettlement Framework (RF) in line with the ESMF is prepared to provide a guidance to assess any risk of resettlement and to prepare sub-project specific Resettlement Plan (RP) in case a requirement.</p> <p>Sub-project specific RPs will be prepared in order to account for the discrepancies with the national legislation. Particular concern will be given in RPs on vulnerable groups.</p>

WB ESSs	Gaps	ESF Documents/study to fill the Gaps
		Livelihood impacts of sub-projects on informal land users will be assessed and Livelihood Restoration Plans (LRPs) will be prepared as relevant to sub-projects.
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	There is no gap in terms of policy level. On the other hand, in some cases, level of the considerations of not legally protected sensitive ecological areas such as Key Biodiversity Areas in local EIA Process are not sustain the requirements stipulated by ESS6. Furthermore, management and monitoring of potential impacts, mitigation measures and residual impacts are not detailed in general.	Depending on the location of the sub-projects and pertinent impacts, Biodiversity Management and Action Plans can be annexed to the ESIA/ESMP.  Sub-projects which have significant impacts in terms of biodiversity will be considered as ineligible.
ESS 8: Cultural Heritage	Turkish national legislation on protection of cultural assets mainly satisfies the ESS 8 requirements for physical cultural heritage, but fails to cover intangible cultural heritage.	Sub-project specific environmental and social assessment will take into consideration the significance of intangible cultural heritage that may be materially affected or put at risk as a result of the sub-project.
ESS 10: Stakeholder Engagement and Information Disclosure	Effective and transparent stakeholder engagement is the main gap in terms of ESS10 requirement. Within this scope, a Stakeholder Engagement Plan required to identify the different stakeholders (project-affected parties and other interested parties including disadvantaged or vulnerable). Stakeholder engagement should be a continuous and well-documented process throughout project duration.	SEF is in place as part of E&S documents. Sub-project level SEPs will be prepared depending on the level of social risks. TULIP SEF will be operational throughout implementation of the Project, including an overall disclosure of information on sub-projects and the grievance mechanism.

## 5. INSTITUTIONAL FRAMEWORK

### 5.1. Roles and Responsibilities

Basin management policies are centrally planned in Turkey. The governmental organizations undertake the planning, development, management, maintenance, and monitoring and evaluation of programs related to river basin management. The local authorities are involved at the stage of implementation and non-governmental organizations are also indirectly involved in many activities. Direct stakeholders of basin management and their main responsibilities in relation to basin management as well as institutional responsibilities of them within the Project are indicated Table 5-1 below.

**Table 5-1 Governmental Stakeholders for Basin Management**

Organization	Main tasks and responsibilities	Institutional Responsibilities within the Project
<b>Ministry of Environment, Urbanization and Climate Change (MoEUCC)</b>	<ul style="list-style-type: none"> <li>• Pollution prevention in water resources</li> <li>• Overall coordination of environmental policies</li> <li>• Approve and ensure environmental plans</li> <li>• Ensure implementation of SEA By-law and EIA By-law</li> <li>• Ensure harmonization with EU acquis</li> <li>• Regulate classification of water resources per quality parameters</li> <li>• Issue permits and monitor wastewater discharges</li> <li>• Review and approve treatment plant projects</li> <li>• Ensure protection plans are in place for water resources</li> <li>• Coordinate and set the regulatory frame related with climate change</li> <li>• Coordinate and monitor climate change action plans</li> <li>• Set policies for adaptation to climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Review and approval of SEA for ILMPs if required,</li> <li>• Review and approval of EIAs and/or PIF for sub-components during implementation as per national legislation</li> <li>• Providing permits to the treatment plants</li> </ul>
<b>General Directorate of Forestry (OGM)</b>	<ul style="list-style-type: none"> <li>• Protection, maintenance and sustainable management of forests and forest connected pastures, afforestation and reforestation, restoration of riparian ecosystems and stream corridors</li> <li>• Erosion and sedimentation control, upstream natural water retention and storage, land slide and flood control work</li> <li>• Income generation and livelihood diversification activities for forest communities, such as bee-keeping, non-timber forest products, and ecotourism services</li> <li>• Integration of the socio-economic dimensions and provision of services to upland communities</li> </ul>	<ul style="list-style-type: none"> <li>• Leading and coordinating agency for the Project</li> <li>• Implementation of sub-components 1.1 (a), 2.1 and 2.2.</li> <li>• Preparing ESIA, ESMPs, SEPs, RPs and LMPs as relevant related to its project activities, and to carry out its M&amp;E activities.</li> <li>• Receiving and processing complaints in accordance with Grievance Mechanism (GM).</li> </ul>

<b>General Directorate of Agricultural Reform (TRGM)</b>	<ul style="list-style-type: none"> <li>• Improving the quality of life and economic diversity in rural areas</li> <li>• Collecting agricultural data and generating statistics</li> <li>• Increasing productivity in agricultural irrigation</li> <li>• Carrying services related to global climate changes, agricultural environment, drought, desertification, other agricultural disasters</li> <li>• Working on the marketing of agricultural products</li> <li>• Working on the support to be given to the agricultural sector and rural areas</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of sub-component 1.1.(b) including planning, procurement, contract management, supervision, and financial management,</li> <li>• Preparing ESIA's, ESMPs, SEPs, RPs and LMPs related to its project activities, and results monitoring and evaluation</li> <li>• Receiving and processing complaints in accordance with Grievance Redness Mechanism</li> </ul>
<b>General Directorate for State Hydraulic Works (DSI)</b>	<ul style="list-style-type: none"> <li>• Conduct investigations and develop water resources</li> <li>• River basin development</li> <li>• Overall development and management of water resources</li> <li>• Hydropower development</li> <li>• Sediment-cleaning works</li> <li>• Drying and draining of waterways because of the damage caused by floods and sediments</li> <li>• Controlling erosion, sediments and floods</li> <li>• Data collection for mapping, hydrometric measurements, water quality, agricultural economy, land classification, drainage, and hydro-geology.</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of sub-component 1.2.(a) including planning, procurement, contract management, supervision, and financial management,</li> <li>• Preparing ESIA's, ESMPs, SEPs, RPs and LMPs related to its project activities, and to carry out its monitoring and evaluation.</li> <li>• Receiving and processing complaints in accordance with GM.</li> </ul>
<b>General Directorate of Combating Desertification and Erosion</b>	<ul style="list-style-type: none"> <li>• Formulating policies, strategies, plans and projects,</li> <li>• Building coordination and cooperation between concerned institutions and organizations regarding soil conservation, natural resources improvement, combating desertification and erosion, and avalanche, landslide and flood control activities,</li> <li>• Finding solutions not only for Turkey's problems but also for regional and international problems.</li> </ul>	N/A
<b>General Directorate of Nature Conservation and Natural Parks (GDNP)</b>	<ul style="list-style-type: none"> <li>• Conservation of biodiversity</li> <li>• Ensuring that ecological services from watersheds contribute to the welfare of both the local population as well as downstream users</li> </ul>	N/A
<b>Disaster and Emergency Management Presidency (AFAD)</b>	<ul style="list-style-type: none"> <li>• Preventing disasters and minimize disaster-related damages, plan and coordinate post-disaster response, and promote cooperation among various government agencies.</li> <li>• Managing disasters through Integrated Disaster Management System, a disaster management model enabling risk management</li> </ul>	N/A

	<ul style="list-style-type: none"> <li>• Developing necessary strategies and serving people in need at home and abroad.</li> </ul>	
<b>General Directorate of Highways (KGM)*</b>	<ul style="list-style-type: none"> <li>• Ensuring the safety of life and property on the roads</li> <li>• Inspecting traffic on roads open to traffic in terms of compliance with traffic safety and marking rules</li> <li>• Collecting and disposing of all kinds of waste materials (rubble, household and similar wastes) that cause environmental pollution and endanger traffic safety</li> <li>• Collecting data on the causes of traffic accidents and taking necessary preventive technical measures</li> </ul>	<p>Implementation of sub-component 1.2.(b)          Preparing ESIA, ESMPs, SEPs, RPs and LMPs related to its project activities, and results monitoring and evaluation activities.          Receiving and processing complaints in accordance with Grievance Mechanism</p>

\* KGM will have roles and responsibilities only within the scope of Bolaman basin sub-projects, as there are not any sub-projects of KGM foreseen in CPA within the scope of TULIP.

The responsibility for overall project management and coordination will lie with the General Directorate of Forestry (OGM) under the Ministry of Agriculture and Forestry (MoAF). OGM is tasked with the protection and sustainable management of the country's forest resources, including soil rehabilitation and erosion control. It is the institution assigned with the responsibility for the implementation of integrated watershed rehabilitation projects under the Forest Code (Law No6831). OGM operates through 21 Departments located in its headquarters, 28 Regional Directorates of Forestry and 12 Research Institute Directorates, with a total of approximately 40,000 staff at the national level.

Other agencies that will be involved in project implementation include the General Directorate of Agricultural Reform (TRGM) and the State Hydraulic Works (DSI) under the MoAF, and the General Directorate of Highways (KGM) under the Ministry of Transport and Infrastructure. TRGM is tasked with improving living conditions in rural areas by promoting the country's agricultural development and competitiveness and supporting agricultural infrastructure and capacities. DSI is the state agency responsible for water resources planning, operations and management. Its primary focus is to plan, design, construct and operate dams, hydroelectric power plants, water supply and wastewater treatment infrastructure, irrigation schemes, and to implement structural flood protection and control measures. It has been affiliated with the MoAF since 2018. KGM will participate in the implementation of subcomponent 1.2.(b) of the project related to strengthening the resilience of rural road infrastructure. KGM is tasked with the identification, construction and maintenance of highways, state and provincial road networks, and bridges to ensure safe transport across the country.

## 5.2. Institutional Arrangements for the Project Implementation in CPA

The Borrower of the IBRD Loan will be the Republic of Turkey, represented through the Ministry of Treasury and Finance.

**Implementing Agencies.** The project will have four Implementing Agencies (IAs), namely OGM, TRGM, DSI, and KGM, as project activities are cross-sectoral, covering a broad spectrum of interventions in the forestry, agriculture, water and transport sectors and reflecting the integrated landscape management approach promoted by the project. OGM will have overall responsibility for project management and coordination acting as the Lead IA, based on its mandate for the implementation of integrated basin projects as per the Forest Law. OGM will manage the Project Designated Account in the Central Bank and be responsible for overall project reporting to the World Bank. Project Components will be implemented directly by the IAs through their respective PIUs, using agreed implementation provisions specified in the POM.

**Project Steering Committee.** A Project Steering Committee (PSC) will be established to ensure effective coordination among IAs. The PSC will comprise of senior leadership from the IAs, other relevant DGs (i.e. DG of Water Management and DG for Combating Desertification and Erosion) and representatives from other relevant institutions. The PSC will be chaired by the Deputy Minister of the MOAF, with the Deputy General Director of OGM acting as the Secretariat. The key functions of the PSC will be to review the annual workplans and budgets (AWPB), monitor implementation progress, ensure effective institutional coordination, and provide advice as needed for ensuring the delivery of project outputs and achievement of project outcomes. The composition and ToRs of the PSC will be further specified in the POM.

**Central-level implementation arrangements.** A Project Coordination Unit (PCU) will be established and housed within OGM at the central level, reporting directly to the Deputy General Director, who will act as PCU Head. OGM will assign a Project Coordinator who will be in charge of day-to-day project-related activities and coordination with other IAs for project execution. The PCU will be responsible for overall project coordination and management, including coordinating the development of project-related AWPB with the other IAs, project supervision, monitoring and evaluation (M&E), and communication and reporting with the World Bank on fiduciary, environmental and social aspects, and overall project implementation progress. The PCU will also act as the PIU of OGM for the implementation of OGM specific activities at the central level. The PCU will be composed of both OGM staff and specialized consultants on fiduciary, environmental and social, and technical aspects, among others. The composition and ToRs of the PCU will be further specified in the POM.

**Central-level PIUs** will also be established in each of the other IAs (TRGM, DSI, KGM) and will be in charge of Ankara-based project activities, including preparation of IA\_-specific project AWPBs and coordination with their respective regional and/or provincial directorates (RDs/PDs). Each Central PIU will be responsible for the implementation of project activities under their respective subcomponents, and for operating their respective project sub-accounts in the Central Bank. They will coordinate with their respective RDs/PDs for the implementation of project activities at the basin level, including procurement processes, as needed. Central-level PIUs will report to the PCU periodically on the realization of relevant project targets and achievement of outputs. Each IA will assign a Project Focal Point acting as Head of its PIU and dedicated staff on fiduciary, environment and social, and M&E issues, as well as on other

technical aspects as needed. The composition and ToRs of the PIUs will be further specified in the POM.

**Basin level implementation arrangements.** Activities at the basin level will be implemented by the RDs/PDs of each IA and their respective Field Offices (FO). The project will be implemented in two different basins, within the borders of five provinces (Ordu, Tokat, Yozgat, Sivas, and Çorum). Thus the project will be executed in three RDs of OGM (Giresun, Amasya, Kayseri), four RDs of DSI (Samsun, Kayseri, Sivas, Ankara), one RD of KGM (Samsun, as in the Çekerek basin there is no activity envisaged for KGM), and five PDs of TRGM (Ordu, Tokat, Yozgat, Sivas and Çorum). Each RD/PD will have dedicated staff assigned by each IA to support project implementation through a Regional Implementation Unit (RIU). To further enhance the capacity for implementation in the field and ensure effective coordination among the RDs/PDs, a Regional Support Team (RST) will be established in each basin under OGM. The physical location of the Bolaman RST will be in the Ordu Province and the Cekerek RST in the Yozgat Province. RSTs will include both staff and specialized consultants to strengthen the technical and administrative capacity of the IAs at the basin level. The composition and functions of the RIUs and RSTs will be further specified in the POM, taking into consideration a flexible structure adaptable to the project needs during implementation.

**Regional Steering Committees (RSCs)** will also be established at the basin-level to ensure effective coordination with local authorities such as Provincial Governors, Municipal Administration and Services in the Bolaman basin, Special Provincial Administrations (SPAs) in the Cekerek basin, Producer Organizations, civil society organizations, and other stakeholders. The composition and functions of the RSCs will be further specified in the POM.

**Relevant Departments of Implementing Agencies.** A number of Departments from each IA will be involved in the design and implementation of project activities. Each IA will assign a Focal Point from the main Department that will act as the PIU Head for overall project management and reporting and for coordinating project activities with other relevant Departments within the IA. The coordination mechanisms with these Departments will be specified further in the POM.

**Other agencies involved in coordination.** Other agencies that will be participating in project coordination and oversight include the DG of Combatting Desertification and Erosion, the DG of Water Management under the MoAF, the Ministry of Environment, Urbanization and Climate Change (MoEUCC), and the Disaster and Emergency Management Presidency (AFAD) of the Ministry of Interior, and others as needed and instructed by the PSC.

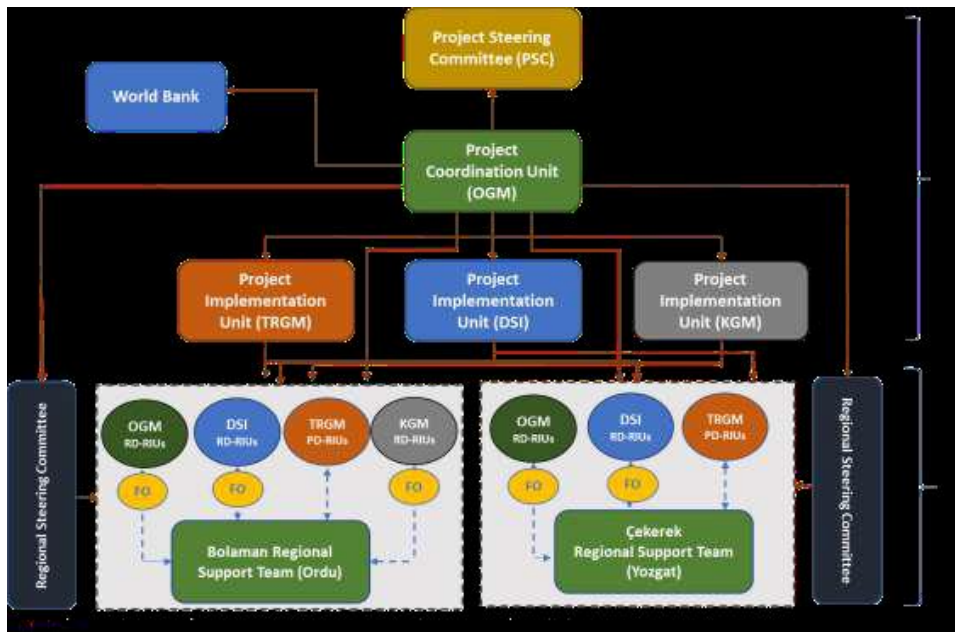


Figure 5-1 Project Implementation Structure

### 5.3. Institutional Arrangements for Implementing ESMF

This section describes the institutional arrangements for the ESMF aspects of the full project management and implementation. Please refer to Figure 5.1 for an overall layout of organization of project units.

The planning level of institutional arrangement of the ESMF will be through PIUs of IAs (DSI, KGM and TRGM) under the overall supervision and guidance of the PCU. PIU for OGM will be the PCU at the same time.

PCU, with its ESF Team established, will manage and coordinate the entire project and technically support and supervise PIUs, on continuous basis.

PCU will supervise PIUs in their screening process for subprojects and will finally review and compile the results of screening before submission to WB for clearance (No-Objection). Preparation of the subproject ESA documents (ESIAs, ESMPs, etc.) will be the responsibility of PIUs under supervision and technical support of PCU, whereas implementation of these documents is the responsibility of PIUs and RDs/PDs of IAs as pertinent to each subproject under direct support and supervision of PCU. PCU will perform an overall quality assurance function that the documents prepared meet the World Bank requirements. The WB will provide prior review and provide No-Objections to the subproject ESA documents. For all subprojects, the site specific ESIAs, ESMPs, LMPs and RPs will also be included in bidding documents and be part of the contract with the contractor selected to carry out the subproject works.

PIUs will report to PCU periodically on the realization of relevant project targets and achievement of outputs including implementation of ESA documents, and PCU will report to the WB on project implementation progress, including technical, fiduciary, E&S, and M&E aspects.

PCU, PIUs and RSTs will include as an ESF Team at least the following qualified and experienced personnel:

PCU (OGM):

- Two Environmental experts with knowledge on WB safeguards and associated procedures; in particular: ESS 1, ESS 3, ESS 4, ESS 6, ESS 8 and ESS 10
- Two Social experts with knowledge on WB safeguards and associated procedures; in particular: ESS 1, ESS 2, ESS4, ESS 5, ESS 8 and ESS 10 and gender vulnerability issues
- One OHS expert with knowledge on ESS 2 and ESS 4
- One Biodiversity expert with knowledge on ESS 6
- One Archaeologist (On demand basis, in case of a change find)

PIUs (TRGM, DSI and KGM each):

- One Environmental expert with knowledge on WB safeguards and associated procedures; in particular: ESS 1, ESS 3, ESS 4, ESS 6, ESS 8 and ESS 10
- One Social expert with knowledge on WB safeguards and associated procedures; in particular: ESS 1, ESS 2, ESS 4, ESS 5, ESS 8 and ESS 10 and gender vulnerability issues
- One OHS expert with knowledge on ESS 2 and ESS 4
- Two dam experts in the case of DSI with knowledge on ESS 4

RSTs (Bolaman and Cekerek Basin each):

- One Environmental expert with knowledge on WB safeguards and associated procedures; in particular: ESS 1, ESS 3, ESS 4, ESS 6, ESS 8 and ESS 10
- One Social expert with knowledge on WB safeguards and associated procedures; in particular: ESS 1, ESS 2, ESS4, ESS 5, ESS 8 and ESS 10 and gender vulnerability issues
- One OHS expert with knowledge on ESS 2 and ESS 4
- One Biodiversity expert with knowledge on ESS 6

The PCU, PIUs and RSTs will deploy additional staff as needed, for proper implementation of the environmental and social framework elements of the project.

ESF Teams other than Consultants at both PCU, PIUs and RST will be trained through a series of sessions geared to WB ESSs, preparation of ESF instruments, gender vulnerability and the main E&S issues specific to both basins. The central level and regional level consultants will also be responsible for trainings (on regular basis) of the government personnel appointed for the project (in house personnel)

Management responsibility for the grievance mechanism in each basin will also lie with the PCU and RSTs. At the central level a grievance coordinator will be mobilized whom will coordinate with central level PIUs. At the basin level, focal point for the grievance mechanism will be the primary responsible staff for collecting and responding the complaints working together with the RD/PD of each IA.

Responsibilities for each central implementation unit are outlined below.

### **5.3.1. Project Coordination Unit (PCU)**

PCU will be the main coordinating body and will be staffed to carry the technical capacity that will technically support other management units of the project.

The ESF responsibilities of the PCU will be as follows:

- Review and present results of screening of the sub-projects for the approval of the WB.
- Coordinate acquisition of technical assistance for preparation of ESF instruments in accordance with the World Bank's requirements.
- Establish an ESF Team and organize training of ESF Team regarding World Bank's E&S assessment standards and procedures, consultation and disclosure requirements.
- Technically support and supervise PIUs in their ESF procedures: preparation of ESIA, ESMPs, SEPs, etc.
- Provide final review of subproject ESA documents prepared by PIUs and submit to the WB for clearance.
- Ensure that sub-project loan documents include agreements to implement project specific ESMPs in line with the ESMF and any other ESSs requirements.
- Establish and ensure efficient conduct of the grievance mechanism and coordinate with the RSTs.
- Ensure project-specific SEPs and LMPs are implemented in line with the SEF and LMP; respectively, and
- Collect and compile implementation reports from PIUs and RSTs, and report to the WB on a regular basis regarding implementation of the ESMF and associated instruments (SEF, RF, LMP, etc.).

### **5.3.2. Project Implementation Units (PIUs)**

PIUs will be staffed by in-house technical personnel that will comprise of environmental experts, social experts and OHS experts with relevant qualification and skills within the scope of this project to coordinate the implementation of ESMF. PIU of DSI will also include two dam safety experts.

To help build improved capacity, PCU will organize trainings to familiarize the PIUs with the WB's ESSs and the ESMF, RF, ESCP, SEF, LMP.

Institutional strengthening will be ensured as the need arises through additional training or acquisition of equipment.

The ESMF responsibilities of each PIU will be as follows:

- Undertake the screening process of the sub-projects regarding E&S risk categorization according to the World Bank's requirements,
- Prepare ESA documents with the supervision and technical support of PCU and present to PCU for final approval,

- Report to the PCU as per implementation of ESIAs/ESMPs, SEPs, LMP, RPs and GMs quarterly during construction stage and semi-annually during the implementation/operation stage.,
- Report to PCU on records of chance finds, OHS accidents, received grievance, consultations.
- Perform monthly supervision of the implementation of ESMF, RF, ESCP, site-specific E&S documents and any other ESSs requirements by their respective Regional/Provincial Directorates (RDs/PDs) and Field Offices (FOs), and document performance, recommendations and any further actions required as part of overall project supervision reporting to the WB.
- Monitoring and auditing environmental and social issues at the sites (including OHS issues) through data collected from the site visits.

### **5.3.3. Regional/Provincial Directorates (RDs/PDs)**

The ESMF will be implemented by the RDs/PDs under direct support and supervision of IAs in the two basins. Each RD/PD will have dedicated staff that will be assigned by each IA to support project implementation through a Regional Implementation Unit (RIU). The overall roles and responsibilities and capacities of key organizations are described below.

- Implement the ESIAs/ESMPs, SEPs, LMPs, RP, GM
- Be open and responsive to concerns raised by affected groups and local environmental authorities regarding environmental aspects of sub-project implementation. Execute consultations with these groups during site visits, as necessary.
- Compile and present quarterly monitoring reports to PIUs
- Inform PIUs and PCU promptly on the status of implementation of ESIAs/ESMPs and any anticipated changes to those
- Carry out regular stakeholder engagement in line with the SEPs and report to PIUs regularly
- Ensure smooth and correct implementation of the ESIAs/ESMPs, SEPs, LMPs, RP, GM
- Assist PIUs for compiling and presenting quarterly monitoring reports

### **5.4. Assessment of ESMF Implementation Capacity of Partner Institutions**

Among national government agencies, the General Directorate of Forestry (OGM) is the coordinator whereas, the General Directorate of Agricultural Reform (TRGM) and the General Directorate of State Hydraulic Works (DSI) of the MoAF as well as the General Directorate of Highways (KGM) of the Ministry of Transport and Infrastructure are the other IAs which are also to be supported through the Project.

All IAs are subject to Turkish national laws and regulations. Therefore, they are responsible for the application of various law and regulations including Environment Law, Expropriation Law, Resettlement Law etc. for the sub-projects financed through the Project.

The key procedural documents managing the project's environmental and social screening, review and monitoring procedures for sub-projects will be based on ESMF, RF, SEP and LMP prepared in consideration of the national regulations and the ESF requirements.

For the World Bank-financed projects, these framework documents are duly described and referred to in -the Project Appraisal Document (PAD) and main provisions and procedural steps are integrated into the Project Operational Manual (POM). Also ,the core elements are referred in the Loan Agreements. Therefore, PCU and PIUs are fully responsible for the satisfactory implementation of the provisions and requirements specified in the project ESF documents, both frameworks and site-specific. The ESMF additionally requires that sub-project-specific ESA documents are prepared and become parts of respective bidding documents and construction and consultancy contracts as appropriate. Through these contract agreements, IAs manage and oversee the compliance of project activities with the World Bank ESS requirements.

All four IAs have experienced staff in technical and procurement related procedures of Turkey, with limited experience in WB's ESF requirements. . An ESF training program is suggested for PCU and PIU core E&S specialists. The PCU E&S team will include at least six technical experts - two acting as the environmental focal point, two as the social development/land acquisition focal point, one as the OHS focal point, and one as the biodiversity expert. In addition, one archaeologist will be involved in case of chance finds, on as needed basis. For each sub-project's environmental and social risk identification and monitoring, the PCU will conduct regular meetings, informal discussions and joint meetings with the sub-borrowers as necessary. The PCU and central-level PIUS will conduct and attend site visits during sub-project risk identification and implementation. The World Bank team will hold ESF sessions with the PCU and PIUs once the respective E&S staff and experts are on board, and will be providing guidance to the PCU and PIUs throughout the project life as required.

Similar type of experts will be allocated for the central-level PIUs , as they will be mainly responsible for the ESF instruments preparation and implementation.

All four IAs are subject to national law on OHS of the Ministry of Family and Social Security. During the implementation of the project, PCU will ensure that PIUs appoint OHS experts for the supervision for implementation of OHS measures, which are required by Turkish OHS laws and regulations and ESS2.

According to the national OHS Law, all employers must notify the Ministry of Family and Social Services in 3 workdays after OHS related incidents. Specifically, for any significant environmental or social incidents (e.g. fatalities, lost time incidents, environmental spills etc.), the PIUs will inform the PCU in 3 business days, and PCU will inform the Bank about the incident as soon as they are informed. The incident report including root cause analysis, precautions and compensation measures taken, will be submitted to PCU in 30 business days and PCU will forward the incident report to the World Bank.

As government authorities, no one under the legal age (18 years) is permitted to work within the organization, thus no child labor related issues are expected. Cases including unregistered/uninsured employment of refugees, unequal employment opportunities for

women etc. that may be relevant to civil works of contractors may encounter, will not be an issue in terms of incompliance with ESS2 for the IAs.

IAs are committed to ensure compliance of their own operations and those of any contractors or sub-contractors working at the Project with the provision of the Turkish Labor Law and WB ESS 2 requirements in line with the LMP associated to the ESMF.

Key management measures, reporting and monitoring on unregistered/uninsured employment of refugees, unequal employment opportunities for women etc. that may be relevant to civil works that IAs' contractors will be presented in a joint Labor Management Procedures specific to the Project.

**5.5. Capacity Building**

ESS trainings will help to ensure that the requirements of the ESMF and subsequent ESIA and ESMPs are clearly understood and followed by all project personnel throughout the project period.

Both PIUs and RDs/PDs will be continuously supported in technical terms by the ESF Team of the PCU in preparation of WB ESA documents (PIUs) and their implementation as well as compliance with national legislation (PIUs and RDs/PDs).

The training will be provided to the project staff, construction contractors, and other staff engaged in the Project. Training will cover all staff levels, ranging from the management and supervisory to the skilled and unskilled categories. The scope of the training will cover general environmental and social awareness and the requirements of the relevant ESSs under the ESCP, ESMF, ESIA (where relevant) and the ESMP, with special emphasis on sensitizing the project staff to the environmental, social and gender aspects of the region. Table 5-2 provides a summary of various aspects of the environmental and social safeguards training to be conducted under this project. The PIUs may revise the plan during the project implementation as required and subject to PCU approval.

**Table 5-2 Capacity Building Scope**

Target Audience	Contents	Responsibility	Schedule
OGM DSI KGM TRGM	<ul style="list-style-type: none"> <li>• General environmental and socioeconomic awareness</li> <li>• Environmental and social sensitivity of the project area</li> <li>• E&amp;S screening</li> <li>• Key findings of ESIA (as relevant)</li> <li>• Mitigation measures</li> <li>• ESMP</li> <li>• Social and cultural values of sub-project areas</li> <li>• Grievance Mechanism</li> <li>• Gender equality trainings</li> <li>• Conflict management</li> <li>• Research methodologies</li> </ul>	PCU	Prior to the start of the Project activities.

Target Audience	Contents	Responsibility	Schedule
RIUs and PIUs PSC Contractors	<ul style="list-style-type: none"> <li>• General environmental and socioeconomic awareness</li> <li>• Environmental and social sensitivity of the project area</li> <li>• E&amp;S screening</li> <li>• Mitigation measures</li> <li>• Community issues</li> <li>• Awareness of transmittable diseases, risk of Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH)</li> <li>• Social and cultural values</li> <li>• Grievance Mechanism</li> <li>• Gender equality trainings</li> <li>• Conflict management</li> </ul>	PCU	<p>Prior to the start of the field activities.</p> <p>To be repeated as needed.</p>
RIUs and PIUs PSC Contractors	<ul style="list-style-type: none"> <li>• ESMP</li> <li>• Associated Management Plans (i.e. Waste Management Plan, Labor Management Plan, Traffic Management Plan, etc. as relevant).</li> <li>• OHS Management Plan</li> <li>• SEP</li> <li>• LMP</li> <li>• Grievance Mechanism</li> <li>• Cultural values and social sensitivity</li> <li>• Chance find procedure</li> <li>• Gender equality trainings</li> <li>• Conflict management</li> </ul>	PCU	<p>Prior to the start of the construction activities.</p> <p>To be repeated as needed.</p>
Drivers	<ul style="list-style-type: none"> <li>• Road safety</li> <li>• Defensive driving</li> <li>• Cultural values and social sensitivity</li> <li>• Chance find procedure</li> <li>• Gender equality trainings</li> <li>• Conflict management</li> </ul>	PCU Contractors	<p>Before and during the construction activities.</p> <p>To be repeated as needed.</p>
Forest Villagers	<ul style="list-style-type: none"> <li>• OHS Management Plan</li> <li>• Grievance Mechanism</li> <li>• Chance finds procedure</li> <li>• Gender equality trainings</li> <li>• Conflict management</li> </ul>	PCU/PIUs/RDs/PDs	<p>Prior to start of sub-project activities</p> <p>To be repeated as needed.</p>
PIUs	<ul style="list-style-type: none"> <li>• ESMP for operation stage</li> <li>• OHS Management Plan</li> <li>• LMP</li> <li>• Gender equality trainings</li> <li>• Conflict management</li> </ul>	PCU	<p>Prior to the Start of the Project Operation and when required</p>

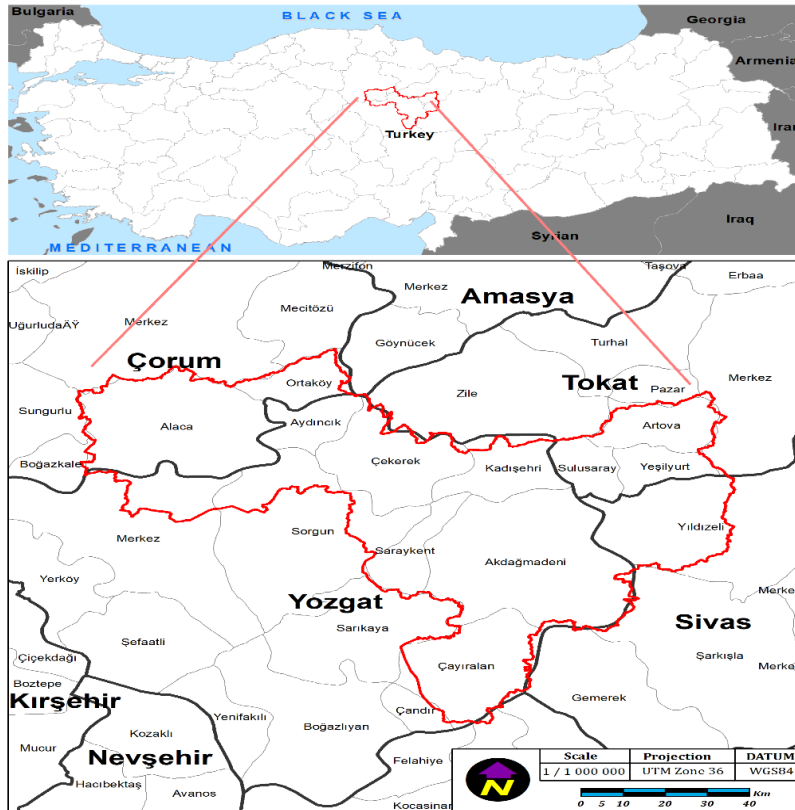
## 6. ENVIRONMENTAL and SOCIAL BASELINE

### 6.1. Environmental Baseline

#### 6.1.1. Geographical Location of the Project Area

The Çekerek River basin is situated within 39° 30' and 40° 45' N latitudes, and 35° 15' and 36° 15' E longitudes. Çekerek River is formed by the combining of small creeks that originate from the Kızık, Dinar, Calı and Kavak hills, near Çamlıbel District of Yozgat. Çekerek River is approximately 276 km in length, and joins the Yeşilırmak River near Kayabaşı village in Akdağmendi District, Yozgat. (Yürekli & Kurunç, 2004).

Cekerek Project Area that is located between Yeşilırmak and Kızılırmak River Basins has a total area of 630,000 ha within the total Çekerek river basin area of 876,551 ha. The current population of districts in CPA is 225,618. The elevation of CPA changes between 531 m. to 2,357 m. CPA largely intersects with the basin of the Çekerek River, while extending beyond at parts to the west and south; and excluding the basin at parts to the north and east. The project area is located within the borders of Yozgat Province (Merkez, Akdağmadeni, Aydıncık, Çekerek, Çayıralan, Kadışehri, Saraykent and Sorgun districts), Çorum Province (Alaca and Ortaköy districts) and Sivas Province (Yıldızeli district), which are a part of Central Anatolia. Districts of Tokat Province (Artova, Sulusaray and Yeşilyurt districts) are located in the Black Sea Region. A large part of the Project Area is within the boundaries of Yozgat Province. See Figure 6-1 for the boundaries of the Project Area.



**Figure 6-1 Project Area within Çekerek Basin**

### 6.1.2. Climate

CPA is situated partly in the interior sections of Central Black Sea Region and partly in the northern sections of Central Anatolia. Hence, it is under the influence of both Black Sea climatic characteristics at the upper part of the basin; and continental climate of Central Anatolia at the lower part.

At the upper parts; summers are generally hot and dry in lowlands, warm and rainy in uplands from place to place. Cold and snowy winters are the general characteristic of the climate prevailing in the Çekerek Project Area.

At lower parts of the basin, harsh climate conditions of semi-arid continental climate soften slightly in the Çekerek River Valley, with the effects of the Black Sea (Yozgat Governorship, n.d.).

#### **Temperature**

Long term monthly average, minimum and maximum temperature values are presented in Table 6-1. These data show that the values below zero at average temperatures are an indication of continental climate characteristics from North to South (DSI, 2016). The average temperature data indicates that January is the coldest month in the basin, which is common for all meteorological stations. Average minimum temperature in January varies between -3.2°C (Artova, Tokat) to 2.1°C (Tokat center) in the basin. On the other hand, the data also

show that minimum temperatures are observed in February and the minimum temperature changes between  $-15.9^{\circ}\text{C}$  (Akmağdeni, Yozgat) and  $-35.5^{\circ}\text{C}$  (Artova, Tokat).

Average temperatures imply the weather temperature is mild during summer in the basin, and the temperatures vary between  $14.9^{\circ}\text{C}$  (Akmağdeni) and  $22.3^{\circ}\text{C}$  (Tokat) during summer months. In terms of highest weather temperatures, August is the hottest month during the year. Highest average temperature is observed in Tokat center with a value of  $22.3^{\circ}\text{C}$ , where the highest temperature is observed as  $45^{\circ}\text{C}$  at the same station.

**Table 6-1 Temperature Records (°C) from Meteorology Stations in CPA**

Station	Observation Period		Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Octob.	Nov.	Dec.	Annual Total
Alaca (Çorum)	1967-2008	Maximum	17.0	19.5	25.5	29.8	32.6	36.2	41.7	38.1	36.1	31.2	24.0	18.0	41.7
		Average	-1.7	-0.8	4.2	9.5	13.6	17.4	20.2	20.2	16.1	10.9	4.8	0.4	9.6
		Minimum	-27.0	-31.2	-26.4	-10.6	-5.5	-2.0	3.0	2.4	-2.2	-8.0	-20.5	-26.1	-31.2
Aydıncık (Yozgat)	1969-1990	Maximum	17.5	22.9	28.5	31.6	34.5	36.5	41.5	37.1	32.9	28.5	25.5	25.8	41.5
		Average	-1.1	1.5	4.6	9.8	14.4	18.0	20.2	19.6	15.9	11.0	5.4	1.4	10.1
		Minimum	-19.4	-23.4	-20.4	-2.2	-2.2	5.2	6.6	6.6	2.4	-2.2	-6.6	-11.8	-23.4
Akdağmadeni (Yozgat)	1965-1990	Maximum	17.4	18.0	22.0	29.6	29.4	32.8	35.0	35.7	33.0	28.8	23.4	15.7	35.7
		Average	-2.9	-1.0	2.4	7.6	11.6	14.9	17.4	17.3	14.3	9.1	4.1	-0.5	7.9
		Minimum	-17.0	-15.9	-12.2	-4.3	0.1	3.4	5.6	5.0	0.9	-2.9	-7.8	-14.5	-17.0
Çorum	1929-2013	Maximum	17.5	20.4	28.6	30.4	35.1	37.5	42.6	40.2	38.7	33.6	25.6	19.2	42.6
		Average	-0.5	0.9	4.8	10.5	15.1	18.6	21.2	21.2	17.1	11.9	6.2	1.8	10.7
		Minimum	-25.6	-27.2	-23.3	-9.4	-4.3	0.2	3.4	3.0	-3.0	-6.3	-21.5	-24.4	-27.2
Artova (Tokat)	1970-1990	Maximum	15.0	16.0	22.5	28.3	30.2	31.3	36.0	36.5	32.0	31.5	27.7	15.5	36.5
		Average	-3.2	-1.4	2.8	8.5	12.5	15.7	18.0	18.0	14.4	9.4	3.9	-0.7	8.2
		Minimum	-35.2	-35.5	-32.0	-9.0	-4.2	-0.6	2.0	0.5	-3.8	-11.2	-21.0	-23.4	35.5
Tokat	1950-2013	Maximum	20.2	22.8	31.1	35.1	36.1	38.5	45.0	40.8	38.9	35.3	35.6	23.0	45.0
		Average	2.1	3.5	7.3	12.5	16.3	19.9	22.3	22.3	18.8	13.7	7.9	3.8	12.5
		Minimum	-23.4	-22.1	-21.2	-6.3	0.0	2.7	6.1	6.7	0.9	-3.2	-11.8	-21.0	-23.4

Source: DSI, 2016

### ***Precipitation***

Data from meteorology stations of Turkish State Meteorological Service and General Directorate of State Hydraulic Works within and at close proximity of the basin have been used in order to understand the precipitation characteristics of the basin. Table 6-2 and Table 6-3 present long term monthly and seasonal average precipitation values of the meteorological stations (DSI, 2016).

Precipitation data show that high altitude sections of the basin, which are approximately forming South and South-East border of the basin, receive more precipitation compared to low altitude sections. These high altitude sections are also forming a barrier between Black Sea and inner Anatolia. The lowest precipitation is observed at Alaca (Çorum), which is located at Çorum-Alaca River subbasin, with an annual average precipitation of 384.4 mm.

Annual average precipitation of 447 mm for the whole basin indicates that the basin has a semi-arid feature. In this respect, precipitation mainly occurs in spring and winter seasons (68.2% of the total annual precipitation), with the lowest figures in summer and August is the driest month.

**Table 6-2 Precipitation Records (mm) from Meteorology Stations in Çekerek Basin**

Station	Elevation (m)	Observation Period	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual Total
Alaca (Çorum)	925	1957-1959 1961-2008	35.9	29.3	35.9	45.9	56.9	41.3	11.4	11.6	17.9	25.9	31.7	40.6	384.4
Ortaköy (Çorum)	800	1961-1976 1990-2012	42.8	34.9	41.6	54.6	55.8	40.2	11.5	7.5	20.4	28.4	42.6	47.2	427.7
Aydıncık (Yozgat)	840	1965-1990	51.3	32.3	43.7	67.5	53.6	31.2	9.9	4.3	14.9	26.4	45.3	54.6	435
Yozgat	1298	1929-1935 1938-2012	66.6	60.9	66.6	60.8	64.5	42.4	12.3	8.6	17.6	34.2	54.7	77.9	567.1
Çekerek (Yozgat)	925	1950-1954 1956-1990	40.9	39.3	39.9	54.6	62.0	44.2	10.9	4.6	12.1	27.8	38.5	40.3	415.1
Akdağmadeni (Yozgat)	1300	195-1900	58.0	49.6	60.6	71.4	72.5	47.5	12.3	8.4	17.4	35.9	45.4	62.7	542.0
Çayıralan (Yozgat)	1340	1950-1990	69.0	53.3	62.1	64.8	64.9	44.5	5.4	3.9	10.3	28.6	47.0	67.0	520.8
Sulusaray (Tokat)	950	1965-1988 1991-2001	47.4	43.0	44.4	60.9	63.7	34.4	11.0	8.9	11.7	34.7	41.0	51.4	452.4
Artova (Tokat)	1200	1938-1990	53.0	40.5	48.9	56.2	64.1	39.5	8.9	4.6	15.9	33.2	43.0	54.9	462.8
Pazar (Tokat)	540	1970-1992	41.7	38.4	39.6	67.7	60.7	41.0	13.2	4.3	14.7	42.7	42.7	42.5	449.2
Yıldızeli (Sivas)	1415	1953-1965 1967-1991	42.1	33.9	44.1	52.5	63.3	35.7	5.9	2.7	13.0	23.6	38.3	45.9	401.0

Source: DSI, 2016

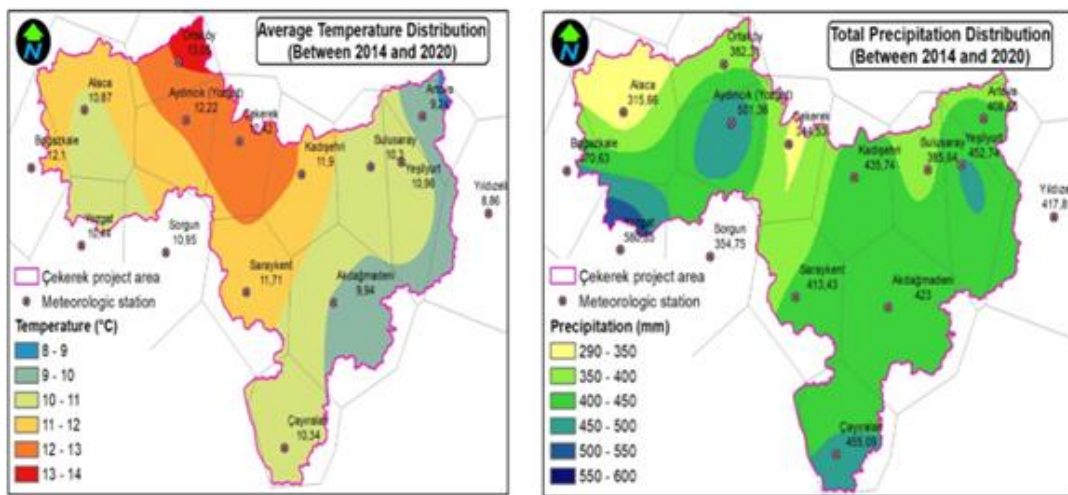
**Table 6-3 Seasonal Distribution of Annual Average Precipitation in Çekerek Basin**

Meteorological Station	Annual Average Precipitation (mm)	Spring		Summer		Autumn		Winter	
		mm	%	mm	%	mm	%	mm	%
Alaca (Çorum)	384.4	138.8	36.1	64.3	16.7	75.5	19.6	105.8	27.5
Ortaköy Çorum)	427.7	152.1	35.6	59.2	13.8	91.4	21.4	125.0	29.2
Aydıncık (Yozgat)	435.0	164.7	37.9	45.4	10.4	86.7	19.9	138.2	31.8
Çekerek (Yozgat)	415.1	156.5	37.7	59.6	14.4	78.4	18.9	120.5	29.0
Akdağmadeni (Yozgat)	542.0	204.6	37.7	68.3	12.6	98.7	18.2	170.3	31.4
Çayıralan (Yozgat)	520.8	191.8	36.8	53.8	10.3	85.9	16.5	189.3	36.4
Sulusaray (Tokat)	452.4	169.0	37.3	54.3	12.0	87.4	19.3	141.8	31.3
Artova (Tokat)	462.8	169.2	36.6	53.1	11.5	92.1	19.9	148.4	32.1
Pazar (Tokat)	449.2	168.0	37.4	58.5	13.0	100.1	22.3	122.6	27.3
Yıldızeli (Sivas)	401.0	159.9	39.9	44.3	11.0	74.9	18.7	121.9	30.4
<b>Average</b>	<b>447.1</b>	<b>166.3</b>	<b>37.2</b>	<b>55.7</b>	<b>12.5</b>	<b>86.6</b>	<b>19.4</b>	<b>138.5</b>	<b>31.0</b>

Source: DSI, 2016

There are 15 meteorological stations within the boundaries of Çekerek Basin, from which average temperature and total average precipitation values have been retrieved. Availability of climate data dates back to 2014 when meteorological stations were established.

Figure 6-2 shows the rate of total average precipitation and average temperature of the Çekerek Basin. The highest average temperature has been recorded as approximately 13°C in Ortaköy. The highest total precipitation average has been recorded as about 580 mm on Yozgat Central Station.



**Figure 6-2 Average Temperature and Total Precipitation in CPA (2014-2020)**

Source: MGM

### 6.1.3. Geology and Geomorphology and Hydrogeology

Çekerek River, which is one of the important branches of Yeşilırmak River, is embedded in many places depending on the structure in the land, which is mostly a plateau between Deveci Mountains (1892 m) and Dağni Mountain (1755 m), and these valleys extend in various directions. The morphology of the Çekerek River, which forms the topographical condition of the basin, has cultural and economical impacts on districts and their associated villages due to river's soil erosion and accumulation characteristics. Especially agriculture, animal husbandry and transportation activities are getting harder due to the rough structure of the land which has significant effects on land use (AYLAR, 2015).

Due to the fact that Çekerek River Basin is in the transition zone between the Black Sea and Central Anatolia, the geology and geomorphology of the basin shows variations. In the upper project area, features belonging to the Middle Black Sea Region come to the fore, and in the lower basin area features belonging to the Central Anatolia Region are observed. The geographical features of the basin are mountainous and rugged, and their slope values are high (AYLAR, 2015).

According to the project "Preparation of Basin Protection Action Plans Project Yeşilırmak Basin (2010)" of TÜBİTAK Marmara Research Center Environmental Institute, different characteristics are observed in lithology throughout the basin. While in the lower basin limestone, conglomerate, magmatic rocks caused gabbro and serpentines are seen; paleozoic, marble, quartzite, mica schist and phyllites are seen in the lower basin.

In the study conducted by Yılmaz (2004) on "Geology and Structural Evolution of the Tokat Massif (Eastern Pontides, Turkey)", a metamorphic complex of pre-Liassic age, which is divided into two basic units in the Tokat region. The researcher states that these units are the Turhal Metamorphics and Devecidağ complex, where Turhal Metamorphics characterize the metavolcanic-sedimentary sequence forming the north of the massif, while the metamorphic units forming the Tokat massif are also observed in other parts of the eastern pontids and along the Northern Anatolian Ophiolite Belt.

Yeşilırmak Metamorphic Unit is the other tectono-stratigraphic unit that controls the geological conditions of the project area. This unit outcrops in a wide range extending from Çorum in the west to Suşehri in the east, within the Tokat Massif. According to previous studies, the Yeşilırmak Metamorphic Unit forms the Paleozoic bedrock of the Tokat Massif and embraces the Triassic rocks as an envelope. The unit consists mainly of metapelite, marble, metalav, metaclastic, pelagic limestone, rootless extraneous blocks (olistoliths) and olistostromal rocks of different origin, age and size.

According to Üstüntaş and İnceöz (1999), the oldest unit outcropping in the region is the Tokat Massif, and formations belonging to the Upper Jurassic-Lower Cretaceous Amasya group consisting of limestones unconformably overlie this rock. In the same study, it is stated that the Amasya group is composed of Ferhatkaya and Carcurum formations that are laterally transitive to each other, and that rocks belonging to the Tokat Massif and the Amasya Group come over the Middle Eocene aged Çekerek Formation in the study area with a tectonic touch. The

Çekerek formation consists of the Kozluca Member, which is generally made of sandstone-mudstone-marl alternation at the bottom, the Kuzualan limestone member consisting of limestone lithology, and at the top, the volcano-sediments named Göynücek agglomerate member made of agglomerate and tuffs. It is stated that the Mio-Pliocene Kemerkaş formation and alluviums unconformably cover all these units.

Akyazı and Tunç (1992) tried to reveal the detailed stratigraphic features of the region. The researchers state that the Turhal Metamorphics, which form the basis of the field, are composed of mica schists, calcschists, epidotchists, mylonite-gneiss, meta-sandstones and meta-quartz sandstones, which are products of low degree of metamorphism. In addition, the researchers, who stated that the youngest units observed in the field consisted of Quaternary aged terrace pebbles, pointed out that the Laramian, Anatolian and Pyrenian phases played a very important role in the geological evolution of the region. In the same study, it is stated that these tectonic movements have observed NE-SW trending folds and drifts parallel to the fold axes.

In the Çekerek River Basin, a drainage network extends along a total length of 12,965 km , formed by the stream flowing approximately 3,253 km continuously, 9,487 km seasonally flowing and 226 km with wide bed. Although the diversity of lithological units and structural elements forming the Çekerek basin caused the development of locally different drainage structures, a branched (dendritic) type of drainage developed throughout the basin.

The Artova Ophiolitli Komplex and Haydaroğlu Formation units, which extend approximately in the east-west direction in the middle parts of the Çekerek basin, have developed more frequently in the form of thin dendritic drainage.

Considering the general geology of the sections with thin (dense) branching in the basin which is presented in the Figure 6-2, it is seen that they are mostly volcanites, their pyroclasts and formations consisting of rocks such as sandstone and claystone. In addition, less frequent, coarse dendritic drainage patterns are observed in marbles within the Akdağmadeni Group/Lithotemy, as in the Yeniköy Formation limestones, where relatively hard and resistant rocks are found. In the sections where steep slopes are observed along the Çekerek River Valley, there is a development in the form of relatively parallel drainage.

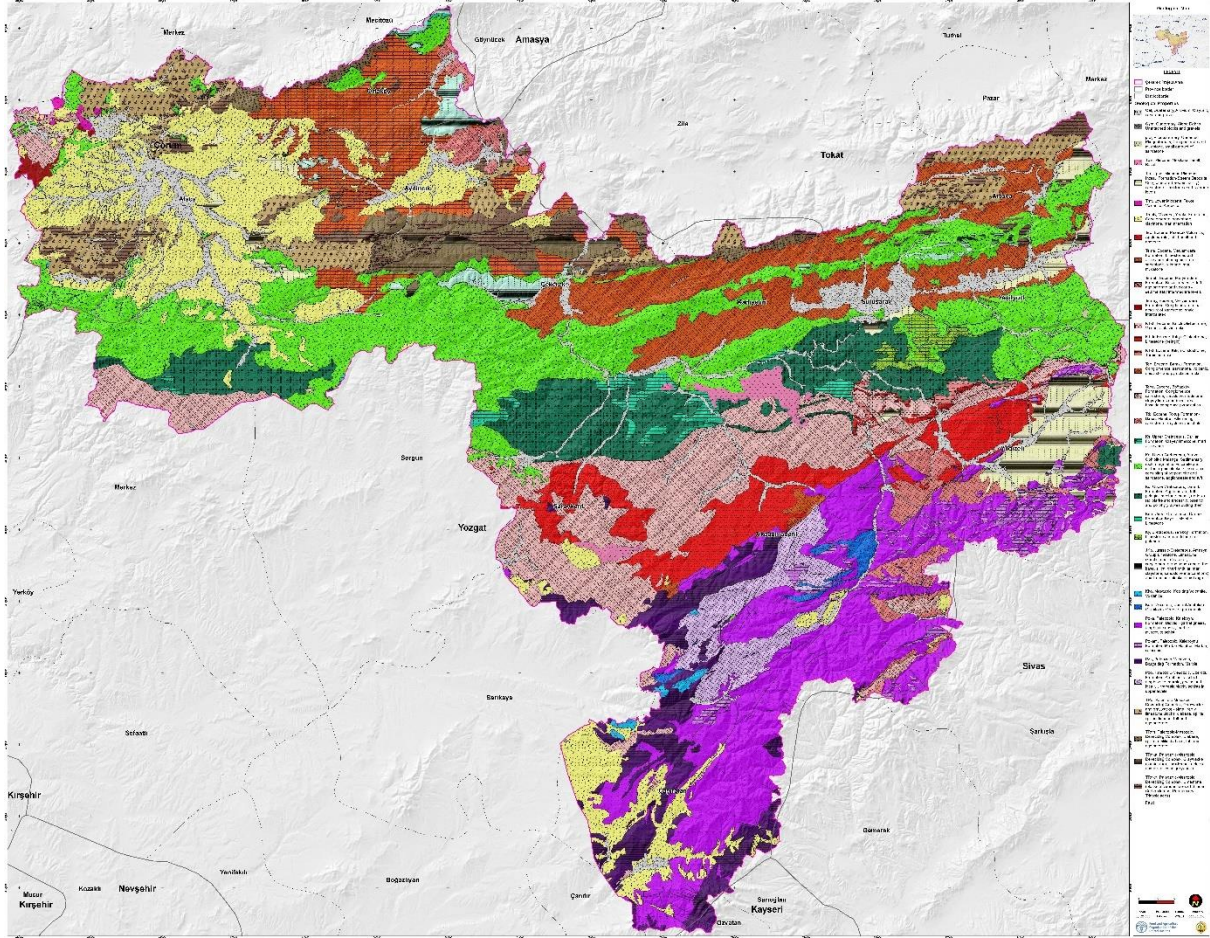


Figure 6-3 Geological Map of CPA

[Access Link](#)

### Hydrogeology

Thin dendritic drainage has developed more frequently in the units of Artova Ophiolitli Karisigi and Haydaroğlu Formation, which extend in the east-west direction in the upper and middle parts of the basin. Considering the general geology of the sections where thin (dense) branching is observed in the basin, it is seen that they are mostly volcanites, their pyroclasts and formations consisting of rocks such as sandstone and claystone. Apart from these, in the marbles within the Akdağmadeni Group, as in the Yeniköy Formation limestones, less frequent, coarse dendritic drainage patterns are observed in places where relatively hard and resistant rocks are found. In the sections where steep slopes are observed along the Çekerek River Valley, parallel drainage development is observed.

In the relatively unstable and weakly cemented Yedikır Formation, which consists of alternation of Upper Miocene - Pliocene conglomerate, sandstone, claystone, marl, which covers a large part of the Çorum subbasin, less frequent, coarse dendritic drainage patterns are observed. In the Boğazköy Formation and the Artova Ophiolite Complex, which outcrop at the southwestern corner of the Lower Basin, a more frequent, thin dendritic drainage has developed (DSI, 2016). Hydrogeologic formations are presented in the Figure 6-4.

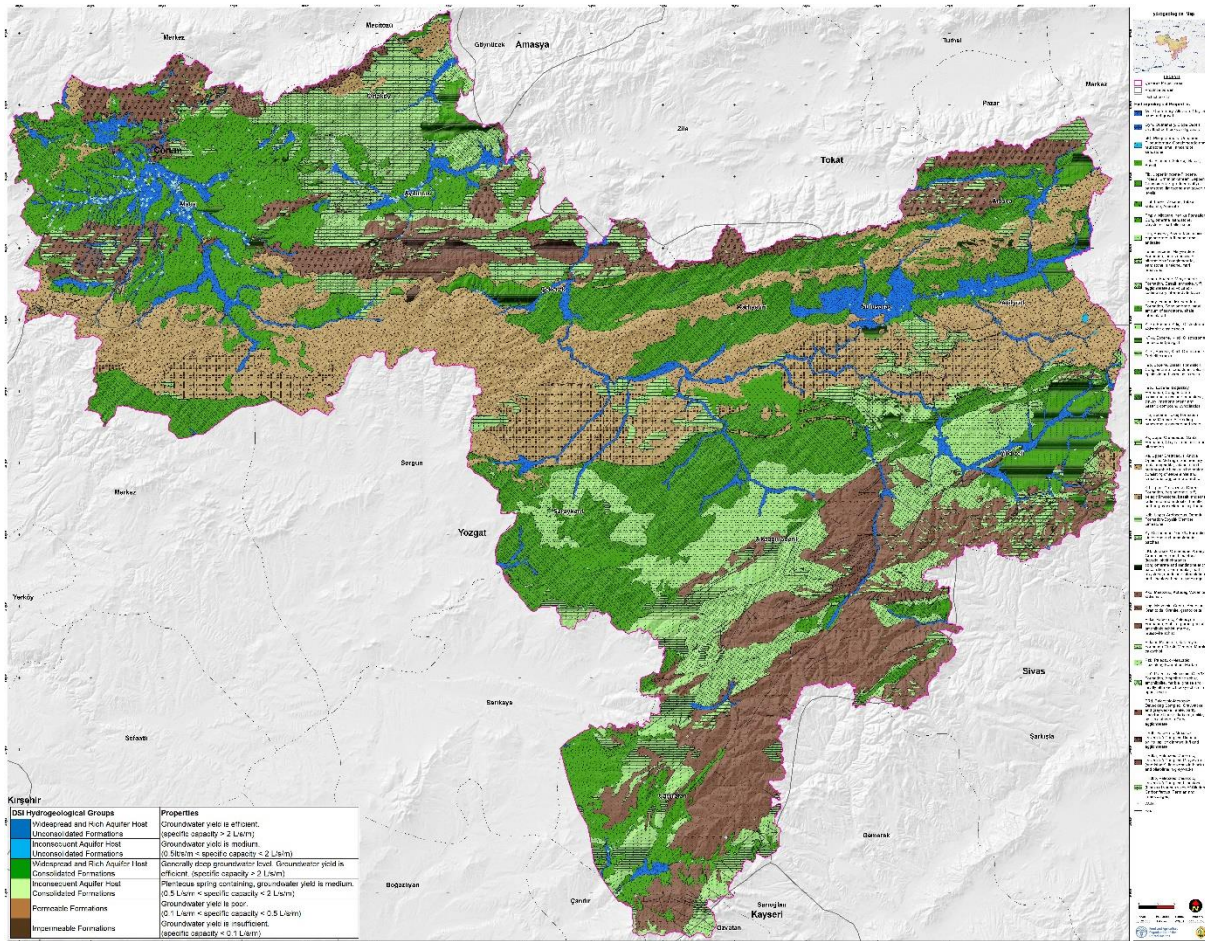
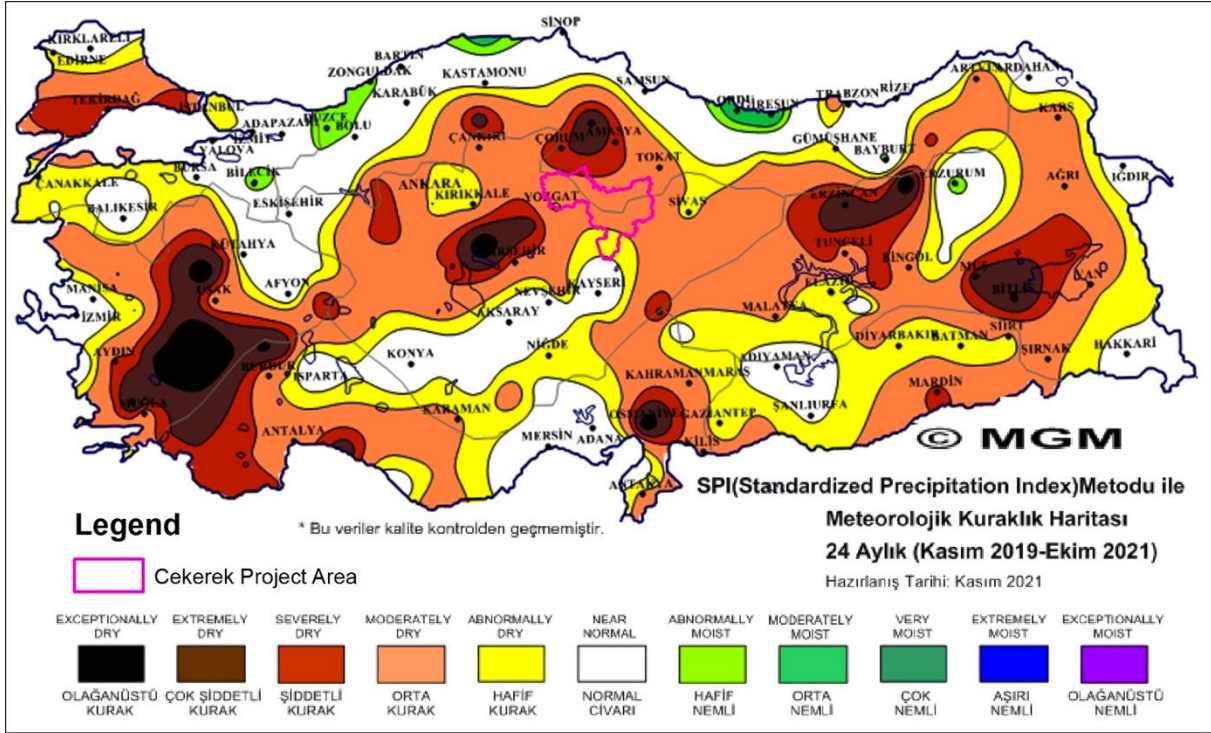


Figure 6-4 Hydrogeological Map of CPA

[Access Link](#)

#### 6.1.4. Drought

As the Disaster and Climate Risk Assessment Report (Aecoom, 2021) states, qualitative research shows that the basin has high exposure to drought hazard. This exposure is higher in the northern areas of the basin since precipitation is higher in the southern areas, due to the increase in the altitude. A Meteorological Drought Assessment Report published in 2021 demonstrated that Turkey experienced meteorological droughts in various regions. As can be seen in Figure 6-5, the drought map of CPA between November 2019 and October 2021 is shown according to the SPI method. Large areas within the Çekerek Basin presented a SPI (Standardized Precipitation Index) that characterised the region by being either 'severely dry' or 'moderately dry'. The importance of drought exposure in the region has been confirmed by stakeholders from OGM and DSI.



**Figure 6-5 Drought Map of 2021 by Standard Rainfall Index**

Natural Disasters from Meteorological Events Report, MGM, 2021

### 6.1.5. Erosion

The slope of the terrain influences the occurrence of erosion in the CPA. Terrains with higher slopes are more likely to present higher rates of erosion and landslide occurrence. The majority of the study area has the potential from medium to high rates of erosion. The regions of the basin with the highest rates of erosion also have the steepest slopes. The Ortaköy, Aydıncık, Çekerek, Kadışehri, Sulusaray, Yeşilyurt and Artova districts are primarily affected from erosion while the districts of Akdağmadeni and Çayıralan in the south of the Çekerek Basin have the lowest potential erosion rates. Figure 6-6 below shows the Slope Map of the Çekerek Basin.

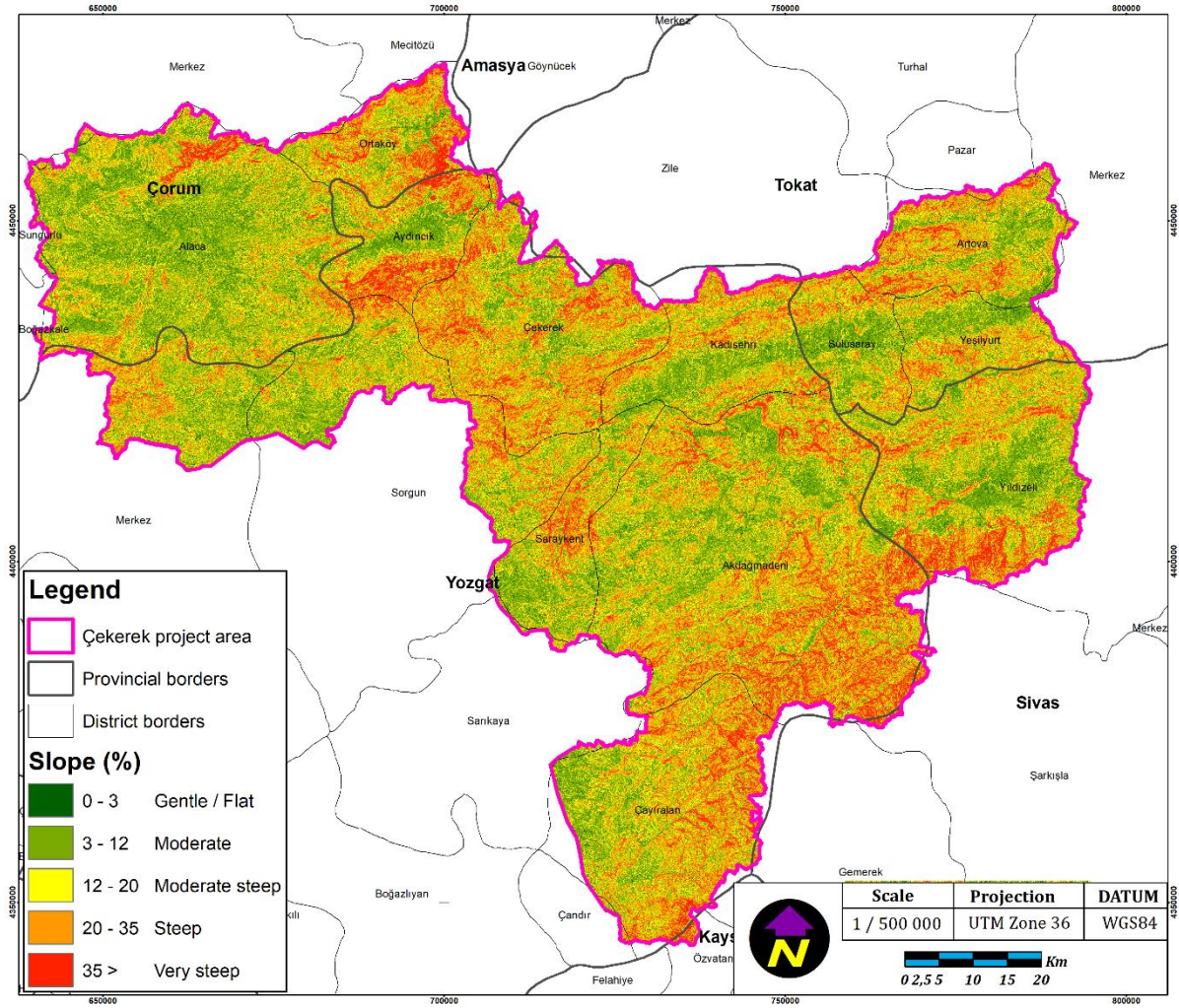
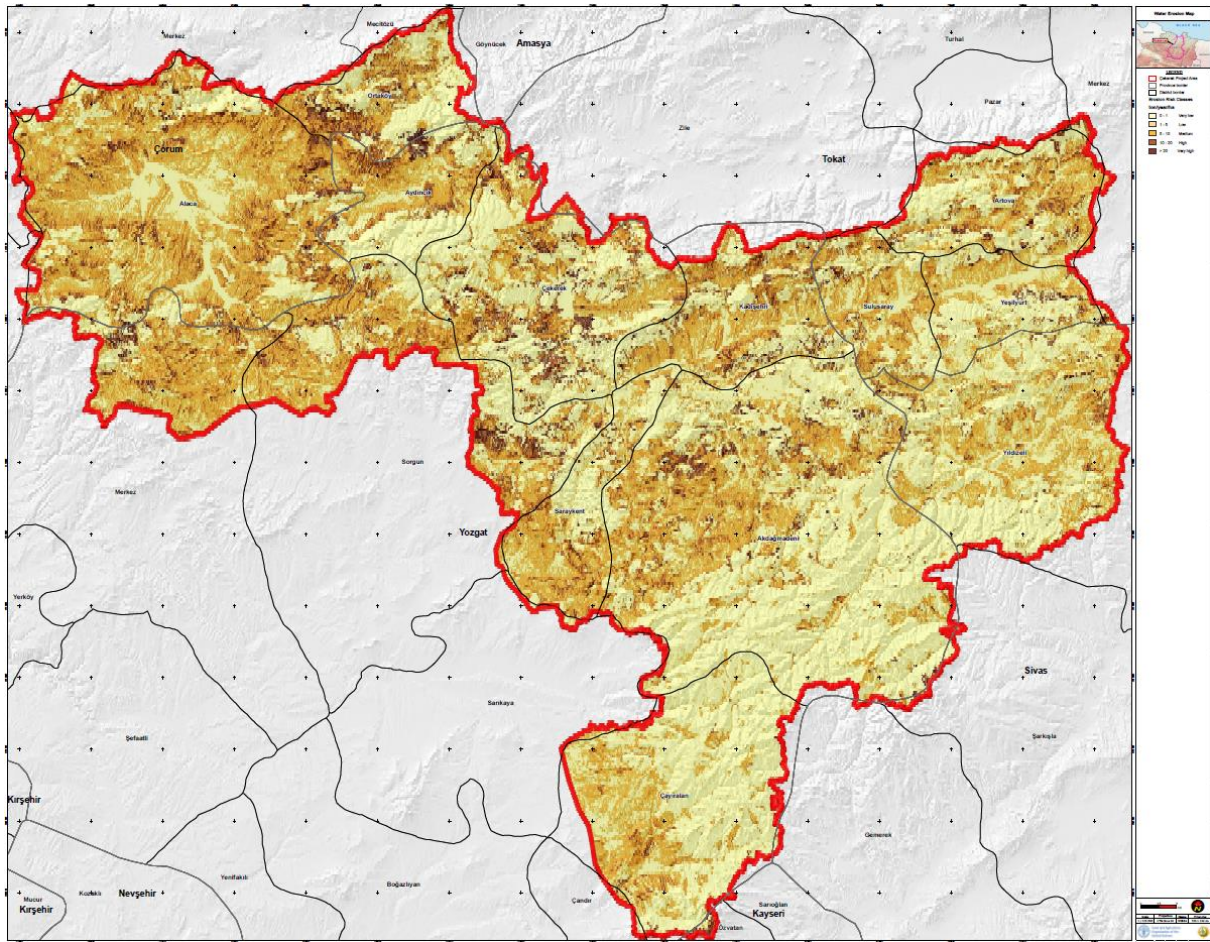


Figure 6-6 Slope Map of the Çekerek Basin (Digital Elevation Model, 2020)

[Access Link](#)

In the Erosion Modeling Report prepared for the Çekerek river basin, the erosion sensitivity of the basin was determined by using the combination of various factors such as slope values, land cover, precipitation values and soil characteristics. According to the Report, the erosion sensitivity of the basin was estimated as 18 tons/ha/year. This value is considerably higher than average of Turkey because it is observed that soil erosion varies between 8.1 tons/ha/year on average throughout Turkey (TEMA, 2019). Erosion intensity is quite high due to the fact that the basin has an arid-semiarid climate and its slope values are high, which has a great effect on the erosion severity in the land cover. The slope of the terrain influences the occurrence of erosion and landslides in part. Higher sloped terrain is more susceptible to experiencing erosion and landslides. As a result of the climate characteristics of the region, forest areas are effective in decreasing erosion as they occupy less space. In addition, dry farming is intensely carried out in the region and this increases the amount of erosion. Figure 6-7 and Figure 6-8 show the water and wind erosion risks in the basin. The current state of erosion in the CPA poses a serious threat, and it is necessary to raise awareness among the

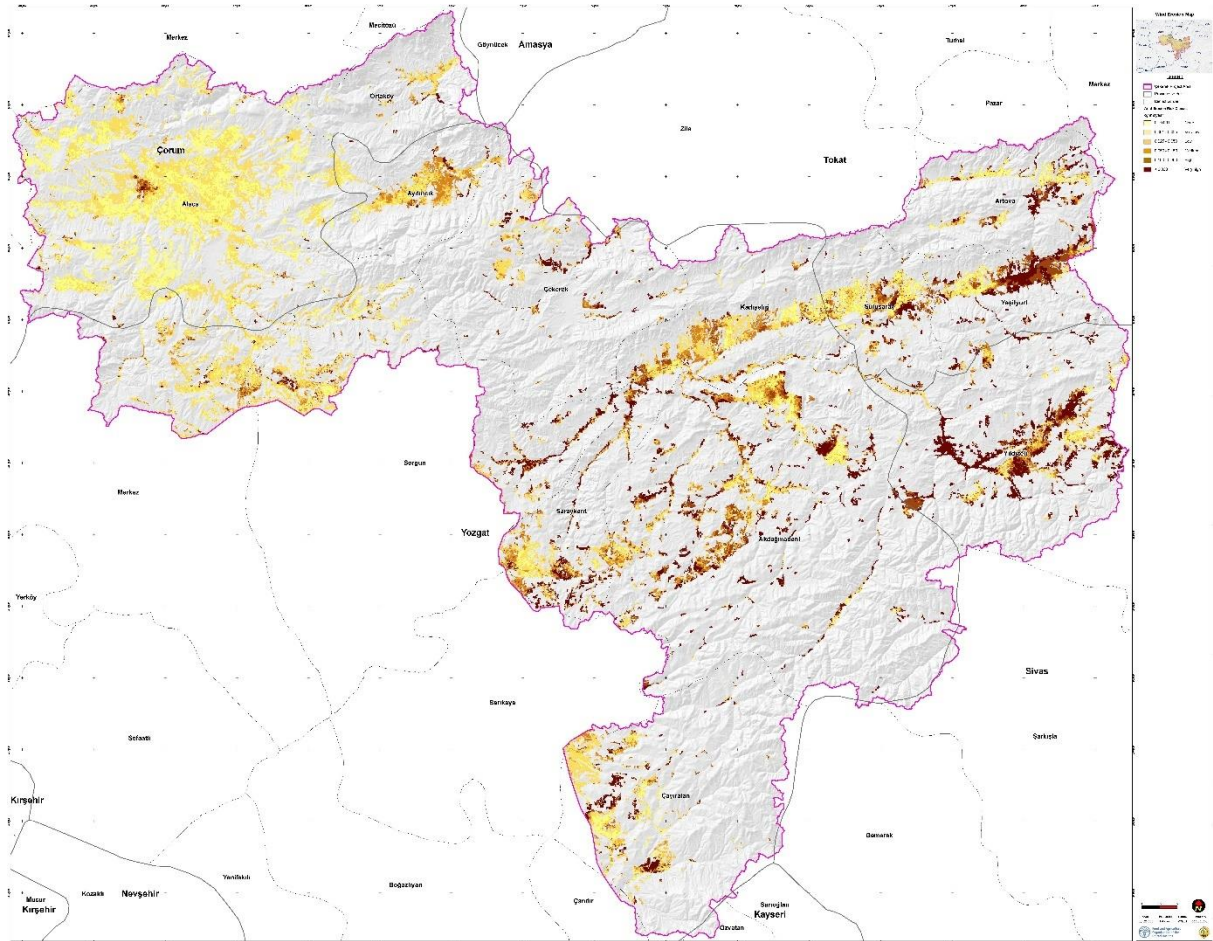
people of the region, especially those dealing with agriculture and livestock breeding, and to comply with Erosion Prevention Plans (Kılıç, et al. 2018).



**Figure 6-7 Water Erosion Risk Map**

[Access Link](#)

Source: MoFA, Directorate General of Combating Desertification and Erosion – ÇEM



**Figure 6-8 Wind Erosion Risk Map**

[Access Link](#)

Source: MoFA, Directorate General of Combating Desertification and Erosion – ÇEM

### 6.1.6. Landslides

Floods and severe rains are not common in CPA, hence the risk of landslides is relatively minimal. The basin has a limited number of active landslide zones, with most of them located towards the north. The most recent landslide occurred in March 2021 in Çorum Province, Akkent Neighbourhood. Three buildings were evacuated as a result of the landslide. The arid and sub-arid environment of the basin also contributes to the low risk of landslides in the studied region. Landslide map of Çekerek Project Area can be seen in Figure 6-9.

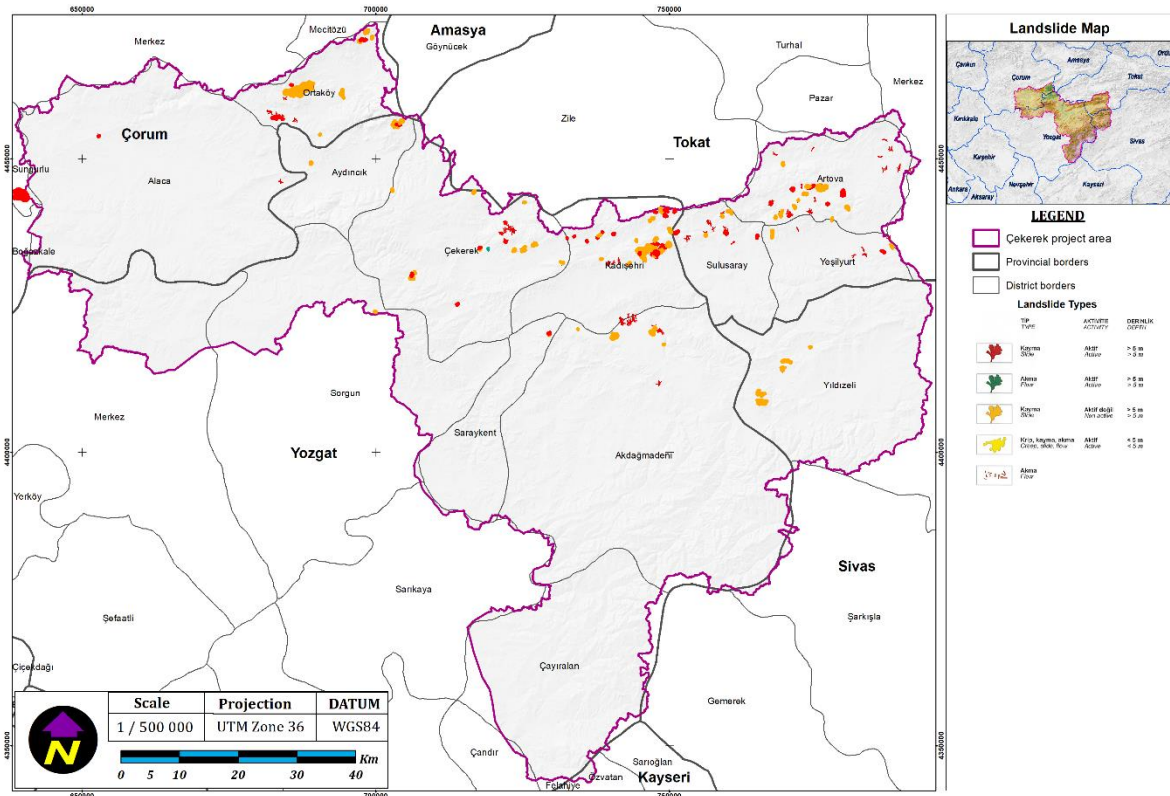


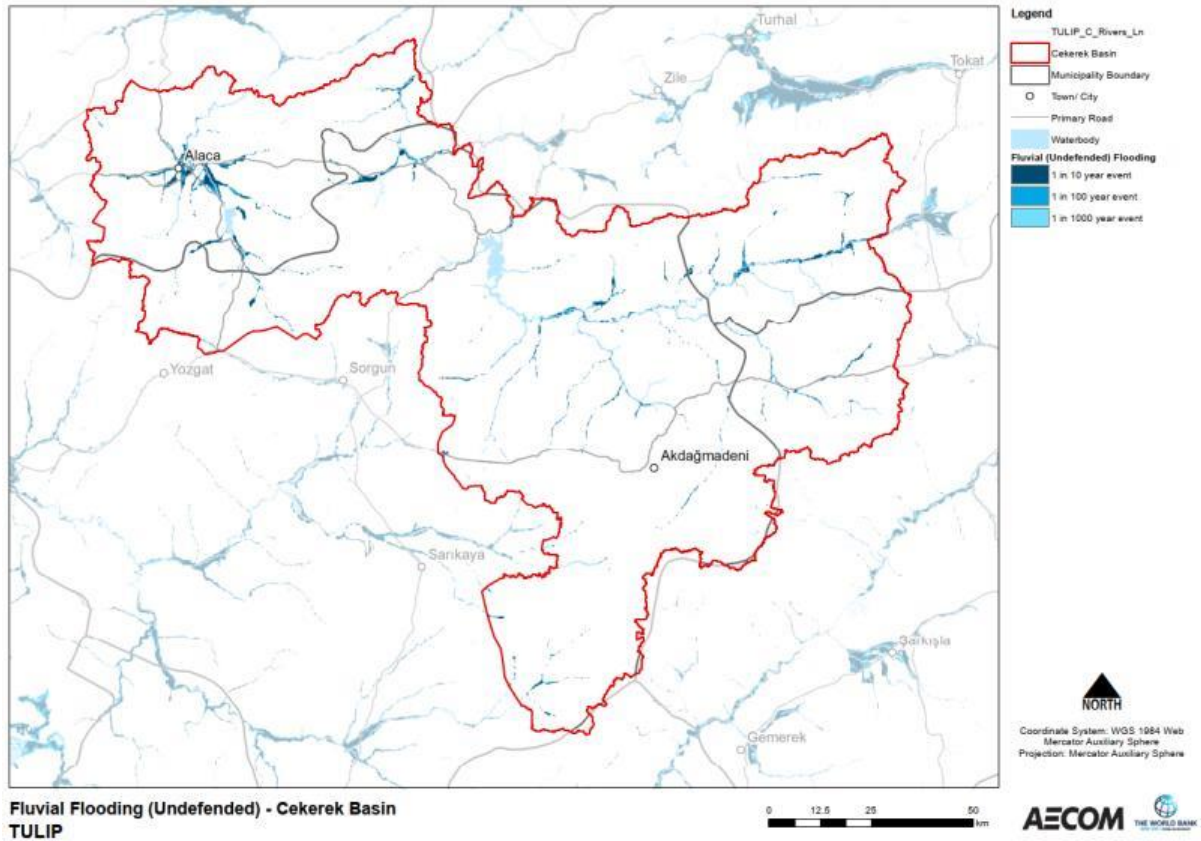
Figure 6-9 Landslide Map of CPA

[Access Link](#)

### 6.1.7. Floods

The flood event data presented in Table 6-4 indicates that floods are not frequent in CPA. Floods in the CPA mostly occur following heavy storms. In general, the main precipitation in the basin is observed during late winter and spring seasons. On the other hand, the data shows that sudden heavy summer rainfalls are the major cause of flood events. Topographical constraints regarding narrow valleys, improper conditions of the stream beds together with manmade structures such as bridges, narrow water underpass channels are the major cause of the floods.

The Report entitled “Disaster and Climate Risk Assessment of the Bolaman and Çekerek Basins” prepared by AECOM in 2021 presents data on fluvial hazard exposure obtained from publicly available sources published by the by GFDRR Innovation Lab (Partnership for Resilience and Preparedness), derived from the SSBN Global Flood Hazard dataset (Figure 6-10):



**Figure 6-10 Fluvial Flooding Map for CPA**

Source: Disaster and Risk Assessment Report, AECOM, 2021

**Table 6-4 Characteristics of Floods that Occurred in Çekerek Basin**

Date	Location	Stream and Tributary	Property Damage	Loss of Lives
13.01.1966	Yozgat (Çekerek)	Gezbel Stream	-	-
		Domuz Stream	31,961 USD	-
11.06.1973	Yozgat (Çekerek)	Kiyi Mevkii Stream	3,026 USD	-
01.09.1974	Yozgat (Çekerek)	Ölüsün Stream	21,285 USD	-
21.08.1971	Yozgat (Akmağdeni)	Çelikpınar Stream	75 Houses	8
23.06.1975	Yozgat (Akmağdeni)	Ekici Stream	-	-
25.08.2007	Yuzgat (Akmağdeni)	Pekmez Stream	5 Work Place, 3 Houses, 2 Building	-

Source: DSI, 2016

The Çekerek (Süreyyabey) Dam and three other hydroelectric power plants manage flow rate down the Çekerek River.

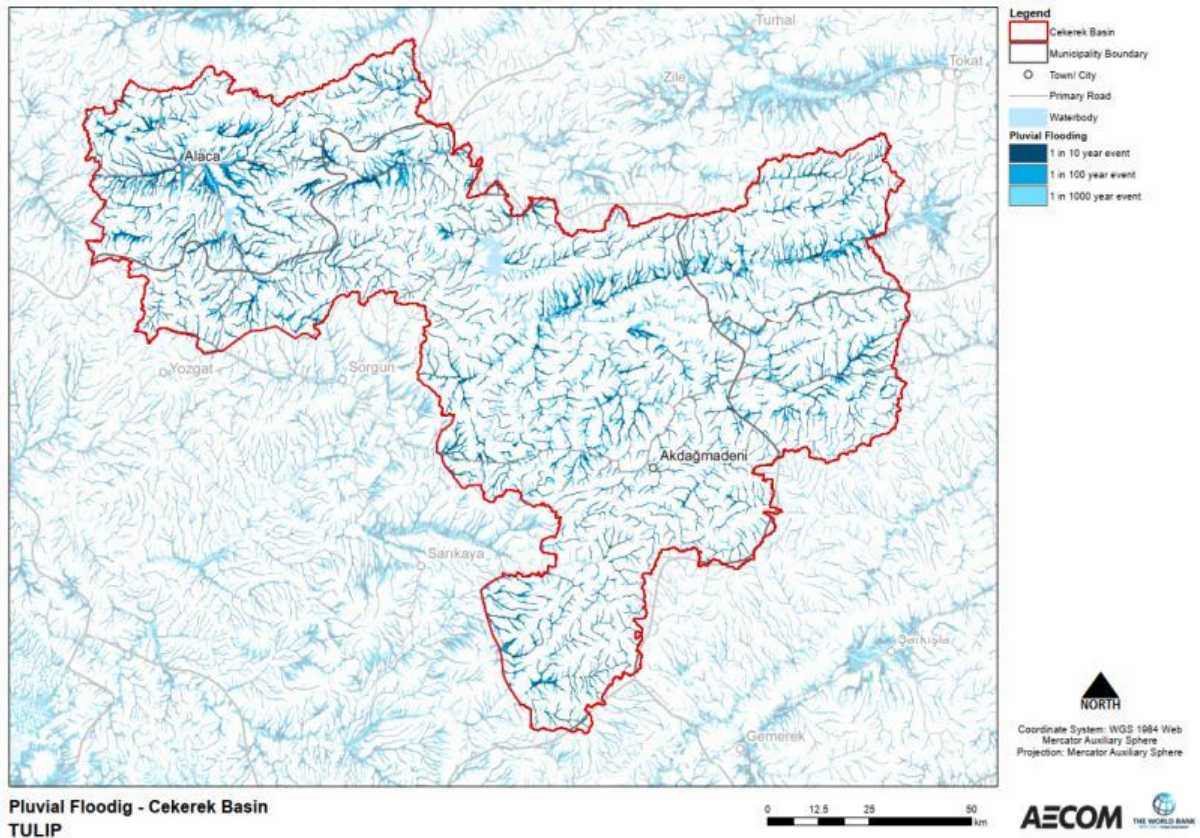
The two provinces, Tokat and Yozgat, faced with one and two flooding events respectively in 2018. More recently there were reports of flooding in June 2019 in the east of the basin in Yıldızeli District. A significant rainfall event led to localised flooding, impacting residential and industrial properties. Fluvial flood hazard exposure is particularly pronounced along the Çekerek River in the east of the basin as the river flows through the Yesilyurt and Sulusaray Districts and further downstream until the river reaches Çekerek with large areas that have 1-in-10-year event flood hazard exposure. The tributaries of Çekerek Basin in the east, such as the Akdağmadeni Creek and Şeyhalil Stream both have significant flood hazard exposure as well as areas near Yangi. Throughout Alaca District, but particularly those in close proximity to the urban area of Alaca, have extensive areas of 1-in-10-year event flood hazard exposure, including along Buyukoz Stream both upstream and downstream of the dam at Koçhisar.

Pluvial flood hazard exposure follows a similar pattern to fluvial flood hazard exposure with particular hotspots in Alaca District and along the Çekerek River upstream of Çekerek and along the tributaries in the higher altitude areas of the east. The tributaries and water course joining the Çekerek to the north have higher pluvial flood hazard exposure than those tributaries joining from the south. Aside from the key hotspots there is a fairly even distribution of high pluvial flood hazard exposure across the basin with 1-in-10-year event flood exposure found in all districts of the basin. Key areas for composite flood hazard are in the Alaca along the Buyukoz Stream, along the Çekerek River through Aydıncık District, and the districts upstream of Çekerek along the Çekerek River, with large areas in close proximity to those waterways highly exposed to flood hazard.<sup>10</sup>

Figure 6-11 shows data on pluvial hazard exposure as obtained from publicly available sources published by the by GFDRR Innovation Lab (Partnership for Resilience and Preparedness), derived from the SSBN.

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<sup>10</sup> Disaster and Climate Risk Assessment of the Bolaman and Çekerek basins under the Turkey Resilient Landscape Integration Project, 2021



**Figure 6-11 Pluvial Flooding Map for CPA**

Source: Disaster and Risk Assessment Report, AECOM, 2021

### 6.1.8. Vegetation Cover

According to the CORINE 2018 data, there is 284,186.51 hectares arable land in the Çekerek Project Area (See Table 6-5). It is analyzed that approximately 80 percentages of these hectares were non- irrigated arable lands (227,654.3) and other 20 percentages consist of permanently irrigated lands. There is also 6,111.32 hectares pasture lands in the Project Area. Condition and classes of the pasture land in the Project Area have been identified, please see Annex 3 for list of pasture assets. For further details, please see Section 6.2.3 for pasture coverage in CPA. Forests cover about 18% of the total land of the Project Area.

**Table 6-5 Land Cover in Çekerek Project Area**

	2000	2018
Landuse Categories	Area (Hectares)	Area (Hectares)
Discontinuous urban fabric	8196.89	11718.94
Industrial or commercial units	63.3	115.54
Road and rail networks and associated land		115.61
Mineral extraction sites	40.67	277.22
Construction sites	37.49	565.85

Non-irrigated arable land	144673.39	227654.3
Permanently irrigated land	78226.14	55827.89
Rice Field	67.38	
Vineyards	2141.49	704.32
Fruit Trees and Garden	2734.71	
Pastures	7474.61	6111.32
Complex cultivation patterns	43112.19	25464.77
Land principally occupied by agriculture with significant areas of natural vegetation	116649.25	108038.72
Agro-forestry areas		46.99
Broad-leaved forest	67153.79	57802.7
Coniferous forest	56020.94	59106.88
Mixed forest	39975.38	39641.98
Natural grasslands	95466.88	72726.43
Transitional woodland-shrub	96758.73	109772.91
Beaches dunes sands	587.68	237.47
Bare rocks	11108.56	4144.54
Sparsely vegetated areas	105568.11	91975.85
Burned Lands	25.32	
Water bodies	479.6	4512.27
<b>TOTAL</b>	<b>876562.5</b>	<b>876562.5</b>

Source: CORINE, 2018

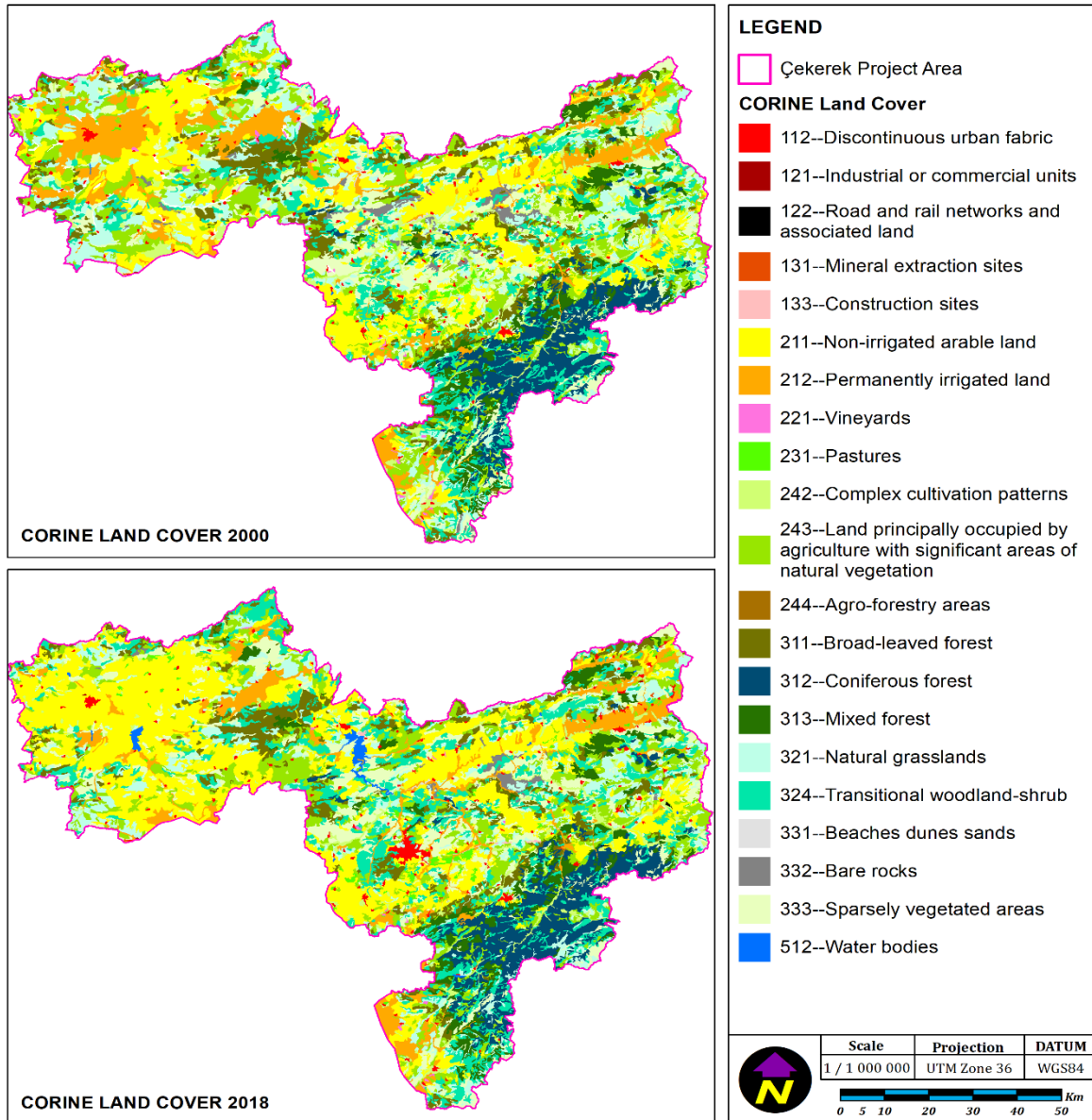


Figure 6-12 Change in the Land Cover between 2000 – 2018

[Access Link](#)

Source: CORINE, European Environment Agency

As the Figure 6-12 shows, permanently irrigated areas have decreased significantly at the northwestern part of the project area, mainly within Çorum between the years 2000 and 2018. This is mainly attributed to the high exposure to drought hazard due to the climate change in the recent years, along with lower precipitation at lower altitudes.

In Tokat, agricultural sector has become dominant in the provincial economy. The main crops grown are wheat, barley, corn, legumes, tobacco, sugar beet and sunflower. In addition, significant amount of fruit is produced in the central district, especially peaches. In the province

where livestock breeding is also important vegetative production and beekeeping activity are also carried out in a widespread manner, especially in the central district, Reşadiye and Zile (DSI, 2016).

Same as Tokat, agriculture and livestock breeding have an important place in the economy of Yozgat Province. Agriculture is carried out on a total of 248,260 hectares of land in the province, with grain cultivation in 189,423 hectares, forage crops in 6,748 hectares and vineyard agriculture in 3,918 hectares (DSI, 2016).

Agriculture sector in Sivas is not sufficiently developed, despite the fact that 97% of land is arable. The areas reserved for plant production are close to one million hectares. Irrigated agriculture is carried out in one fifth of this area, and vine cultivation is carried out on an area of approximately 10,000 hectares (DSI, 2016).

The total area of Çorum Province is 1,278,381 ha, where 535,552 ha (42%) of this area is used as agricultural land. In general, same as Sivas, the rest of the baren land in the province is suitable for agriculture. Baren land, which is suitable for agriculture, is about 548,903 ha (43% of the total area). In addition, the land used as meadow and pasture is 66,425 ha (5% of the total area). The total area used for agriculture and animal husbandry is 615,328 ha, which is 48% of the total land in the province (Çorum Provincial Directorate of Agriculture and Forestry, 2017).

### Land Classification in the Çekerek Basin

Soils of the CPA are defined by 8 classes according to the land use capability classification data produced by Ministry of Agriculture and Forestry. In terms of this classification, first four soil classes are suitable for agriculture. Other three classes, Class 5, 6 and 7 can be used as meadows, pastures and forests, which are not suitable for cultivation compared to the other soil classification. Class 8 soils, which is mainly comprising, salty soils, outcrops or rocky grounds and/or steep slopes etc., are considered as not suitable for any crop production (DSI, 2016). Table 6-6 shows the area of capability classes in the CPA.

**Table 6-6 Çekerek Basin Land Use Capability Classes**

Land Use Capability Classes	Çekerek (ha)
I. Tillage Suitable for Agriculture	85,295
II. Tillage Suitable for Agriculture	134,354
III. Tillage Suitable for Agriculture	124,451
IV. Tillage Suitable for Agriculture	114,262
V. Tillage Unsuitable for Agriculture	550
VI. Tillage Unsuitable for Agriculture	128,994
VII. Tillage Unsuitable for Agriculture	208,302
VIII. Land Unsuitable for Agriculture	4,097
Others	395,402

Total	1,195,707
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Source: DSI, 2016

### Soil Resources and Land Use of the Basin

In order to determine the soil potential in the basin according to the Irrigated Agriculture Land Classification criteria used by the General Directorate of State Hydraulic Works, Soil and Drainage Branch Directorate, Land Use Capability Classes have been converted to State Hydraulic Works Irrigated Agricultural Land Classes. The width and distribution of the land classes obtained as a result of the evaluation of the soil, topography and drainage qualities of the lands according to DSI General Directorate of Irrigated Agricultural Land Classification criteria are given in Table 6-7 below.

**Table 6-7: Distribution of Land Classes According to DSI Standards (ha)**

Çekerek	Land Classification						Total (ha)
	Irrigable Lands (ha)				Non-irrigable Temporarily Lands (ha)	Non-irrigable Lands (ha)	
	1	2	3	4	5	6	
	29,106	174,114	103,919		45,240	843,328	1,195,707

Source: DSI, 2016

#### 6.1.9. Basin Hydrology

Çekerek River Basin is situated in the Yeşilirmak Basin and covers an area of 876,551 ha. See Figure 6-14 for the Hydrology Map of the project area, showing surface water bodies including streams and creeks, lakes, dams, reservoirs/ponds, springs and fountains. Table 6-8 and Figure 6-13 also provide information on sub-basins of Çekerek River Basin.

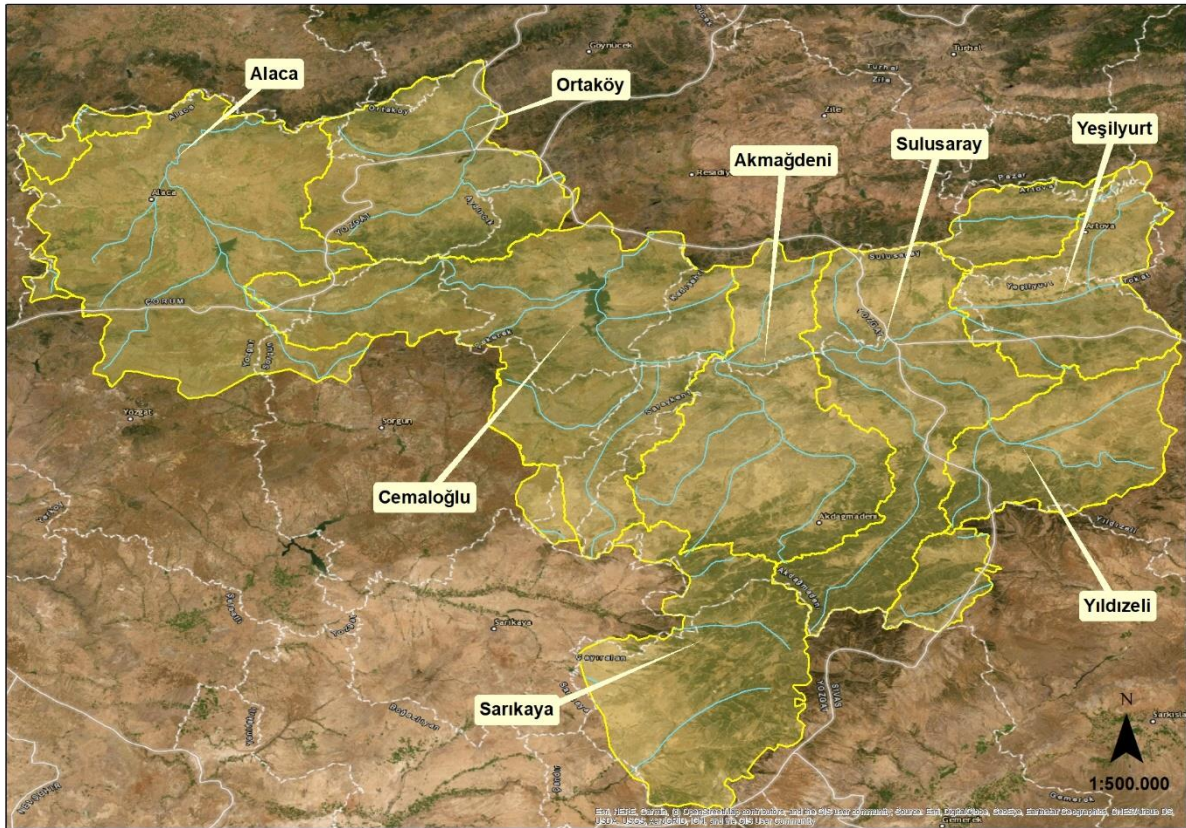
Çekerek river starts at Yıldız Mountains at 50 km northwest of Sivas province and flows in the northeast-southwest direction. The Uyuz lake is shallow lake that formed by the tributaries of Çekerek river flowing into a tectonic valley. Major tributaries of Çekerek are Çorum and Efennik creeks. Çekerek river is 200 km long.

**Table 6-8 Sub-basins of Çekerek River Basin**

Subbasin districts	Area (ha)
Alaca	149,304.2
Ortaköy	79,842.5
Akmağdeni	107,862.6
Sulusaray	105,551.8
Yeşilyurt	60,965.3
Yıldızeli	57,934.3

Sarıkaya	96,684.9
Cemaloğlu	161,122.7

Source: Manipulated Digital Elevation Model with GIS Hydrology Tools by GIS Team



**Figure 6-13 Sub-basin Map of Çekerek River Basin**

Source: Google Earth Imagery

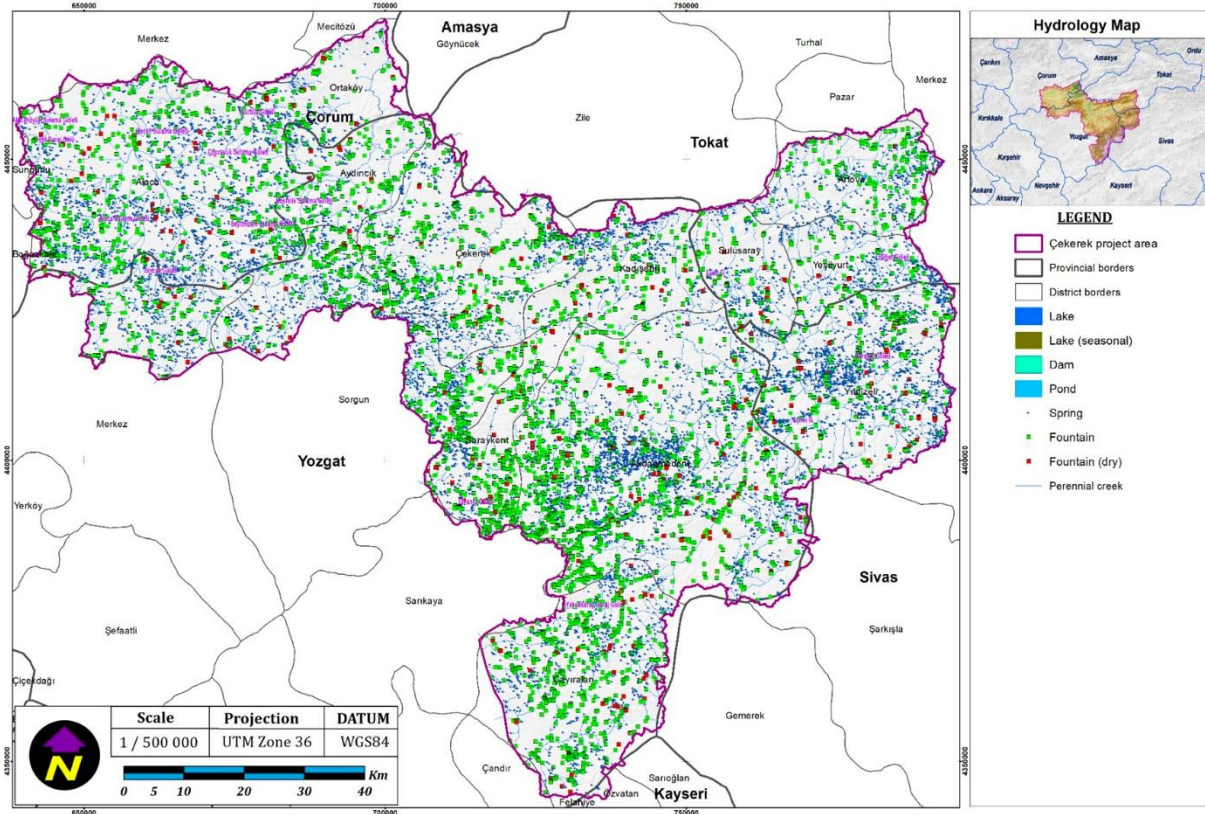
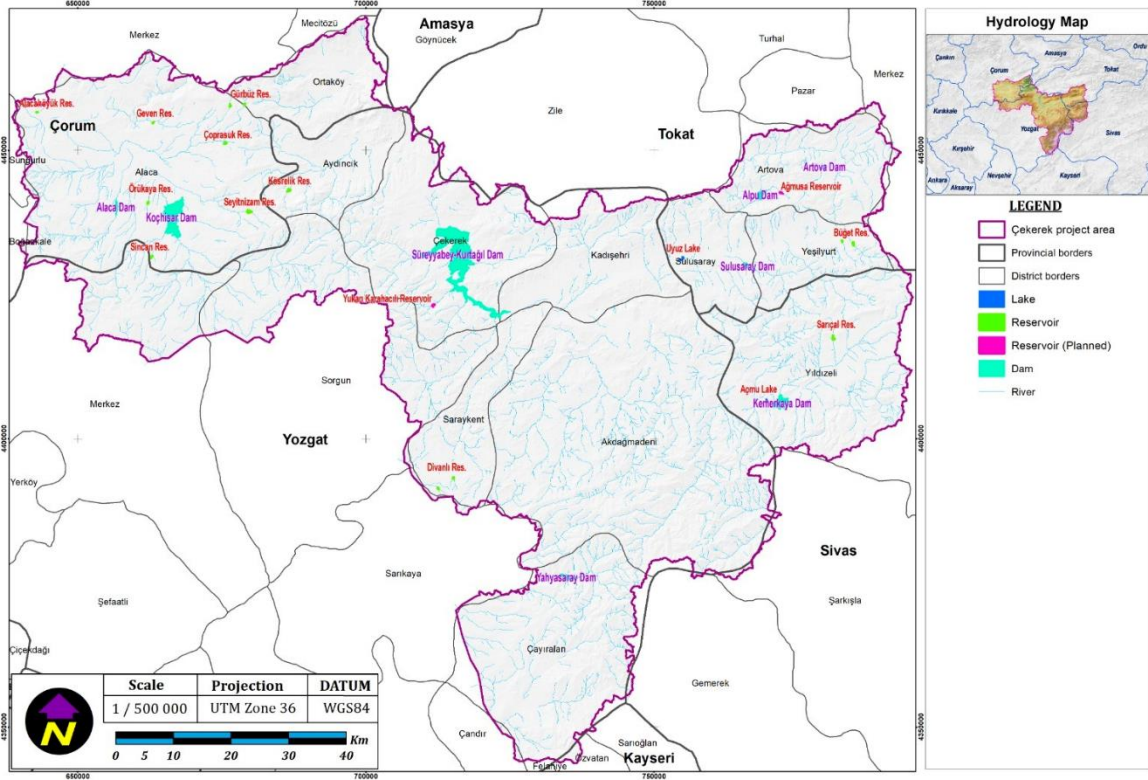


Figure 6-14 Hydrology Map for CPA

[Access Link](#)

In Çekerek Basin main source of water supply is groundwater which is used for drinking water supply mainly, while surface water is mostly used for irrigation. Locations of dams in the CPA can better be seen in Figure 6-15 below.



**Figure 6-15 Location of Dams Within the CPA**

Source: Google Earth Imagery

There is no important lake within the borders of Çorum Province. Eymir (Gölünyazı) Lake, located in the central district, observed as reeds and swamps, whose waters are very low in summer. In the spring small ponds Uyuz Lake and Kırkgöz Lake are in the central district, but these ponds dry up in summer months. There are no significant lakes within the CPA boundaries in Tokat, Sivas and Yozgat provinces.

### Groundwater Resources

The status of groundwater aquifers were assessed within the context of the Project for the Determination and Evaluation of the Quantity and Quality Characteristics of Groundwater in the Yeşilirmak Basin (2018). The Project assessed the status of groundwater in terms of risks related with the supply risks expressed as “quantity status” and level of pollution of expressed as “quality status”. Both categories of status is designated as either “good” or “weak”. The results of the assessments conducted within the scope of the Project for the four main groundwater bodies of the basin are given in Table 6-9.

Supply risks are exerted by extensive groundwater withdrawals mainly for irrigation and livestock, but also for industrial and urban intakes as well; whereas water quality is degraded mainly by pollution due to agricultural factors.

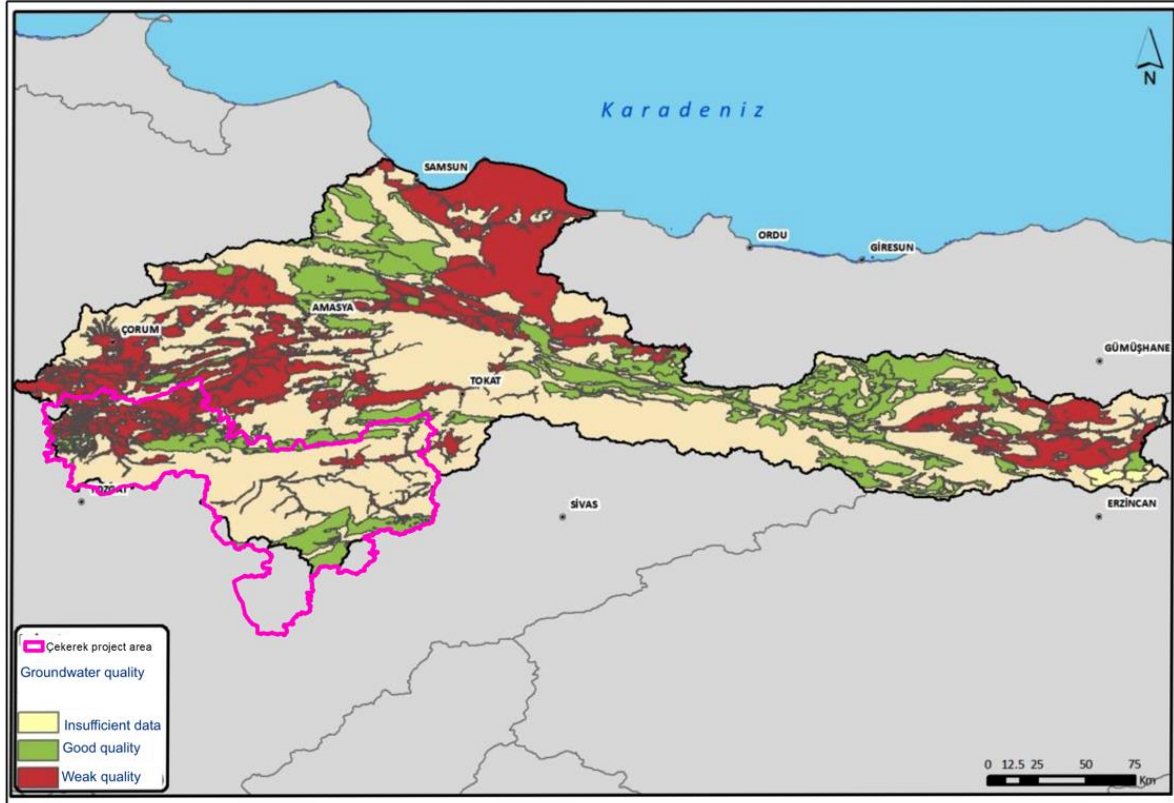
**Table 6-9 Quantity and Quality Status of Groundwater in CPA**

Groundwater Body	Quantity Status	Quality Status	Overall Status
Çekerek	Good	Good	Good
Alaca	Weak	Weak	Weak
Akmağdeni	Good	Good	Good
Sulusaray	Good	Weak	Weak

Source: Project Report of the Determination and Evaluation of the Quantity and Quality Characteristics of Groundwater in the Yeşilirmak Basin (2018)

There is limited information about groundwater aquifers located in Çekerek Basin. In general, high groundwater levels are observed at plain lands in the basin. At these areas, the static groundwater levels vary between 1.5 m and 7.0 m. Groundwater sources in the Çekerek Basin are provided in Table 6-10 below.

Strategic Assessment Report for Yeşilirmak Basin Management presents the groundwater quality mapping, where a major part of Çekerek Project Area can be seen in Figure 6-16 below.

**Figure 6-16 Groundwater Quality in Yeşilirmak Basin and CPA****Table 6-10 Spring and Groundwater Resources in Çekerek River Basin**

Province	District	Amount of Water Drawn from The Source (hm <sup>3</sup> /yr)
Yozgat	Aydıncık	1.42
	Çekerek	2.27

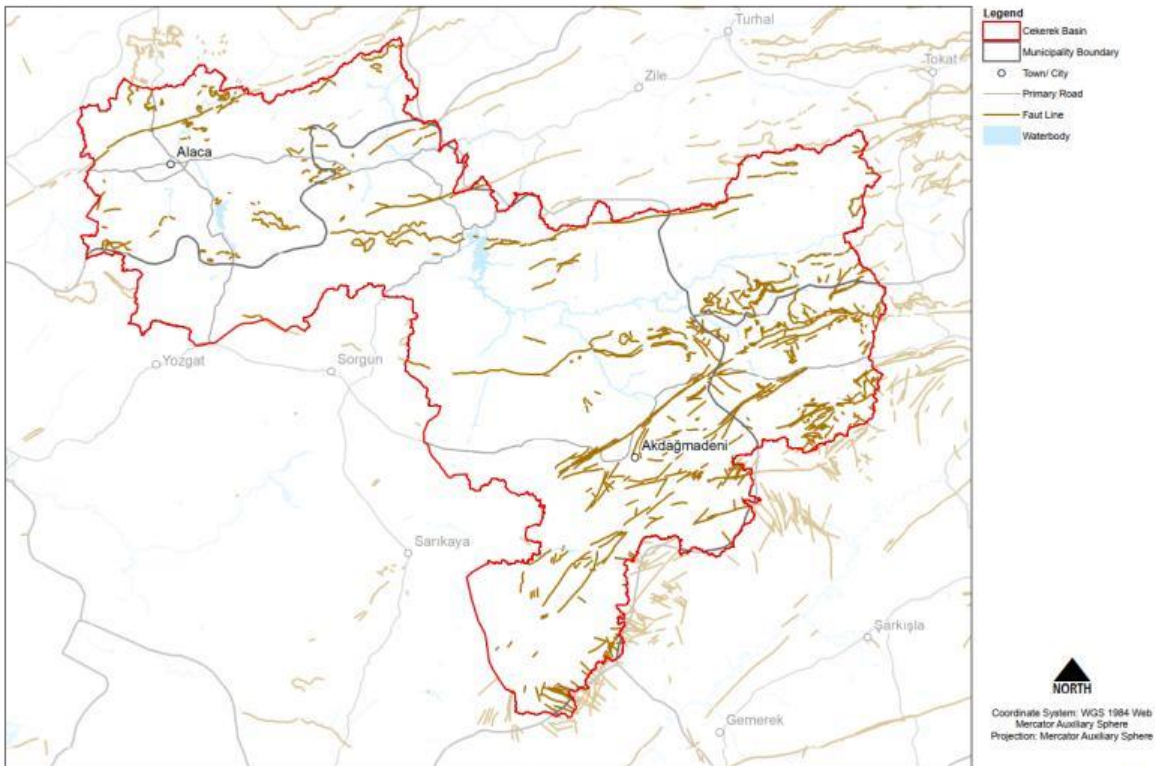
	Kadıřehri	0.99
	Akdađmadeni	1.84
	Sorgun	1.82
Çorum	Alaca	2.12
	Ortaköy	0.82
Tokat	Artova	0.87
	Sulusaray	0.16
	Yeřilyurt	1.49
Sivas	Yıldızeli	0.43

Source: DSI, 2016

### 6.1.10. Earthquake

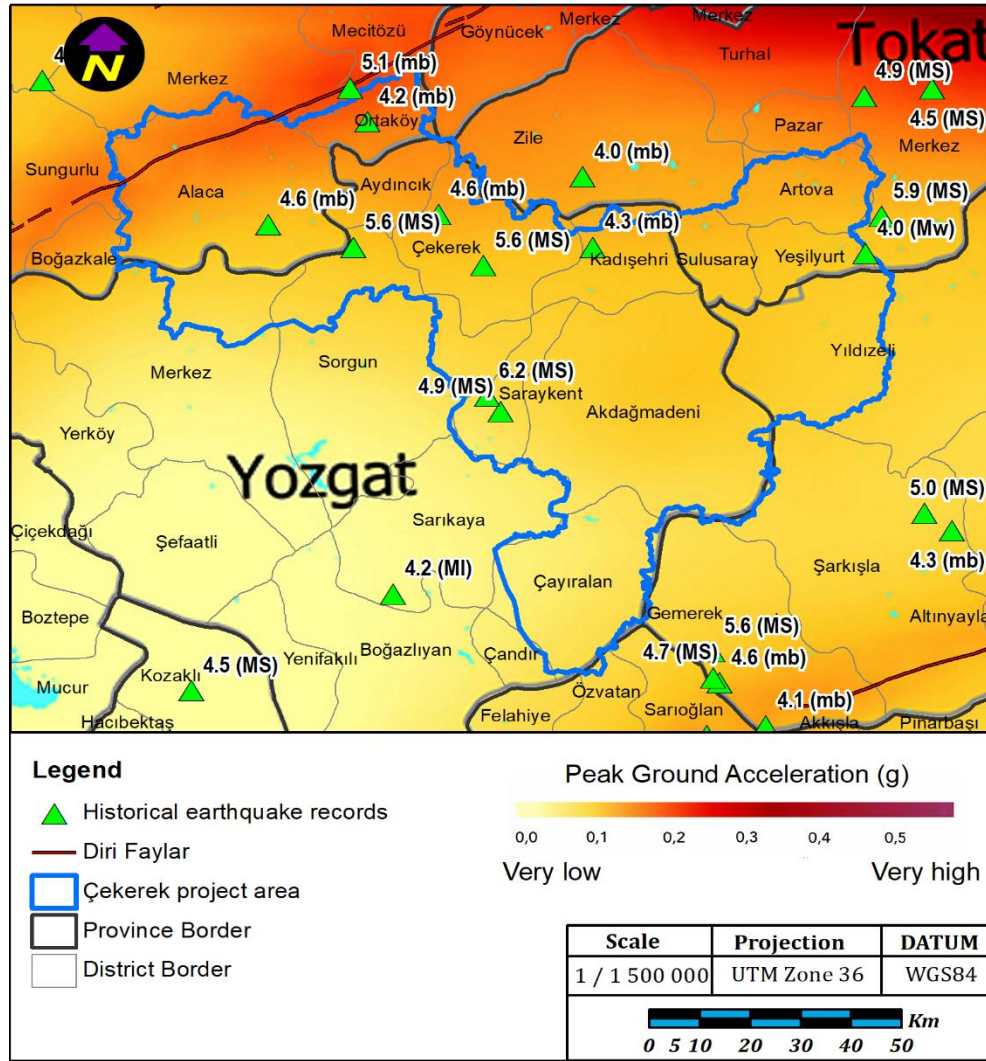
Although there are no active faults in the basin area, the North Anatolian Fault Line, one of the most important earthquake zones of the country, is located to the north of the basin around Çorum Province. Ridges are parallel to the fault throughout in this section, sedimentary drainage and fault valleys are typically seen (DEMİRTAŞ, 2019). In addition, Çekerek Project Area is located in a 3rd degree earthquake zone. Based on historical data, three earthquakes with a magnitude above 5.5 occurred in the Çekerek Project Area. The largest of these earthquakes occurred in Sorgun District of Yozgat with a magnitude of 6.2. Historical earthquake records in the Project Area are depicted in Figure 6-18.

As indicated in Figure 6-17 the main fault systems in CPA are the Akdađmadeni Fault in the South and the Buđdaylı and Çekerek Faults in the North.



**Figure 6-17 Fault Lines in Çekerek Basin**

Source: Disaster and Climate Risk Assessment Report, AECOM, 2020



**Figure 6-18 Historical Earthquakes Map**

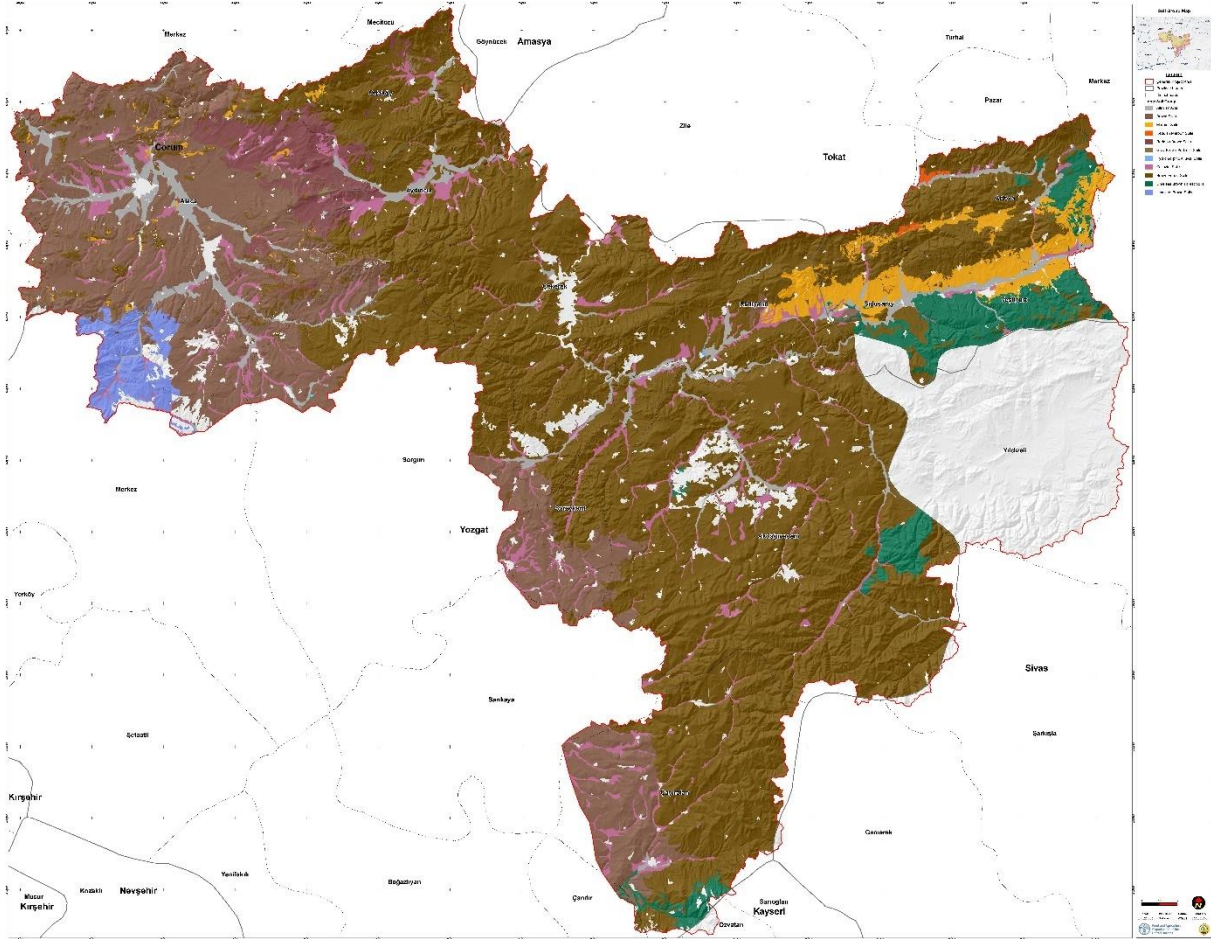
Source: AFAD

### 6.1.11. Soil Characteristics and Soil Quality

Soil types that spread in Çekerek River Basin are alluvial soils, brown soils, maroon soils, reddish maroon soils, reddish brown soils, gray-brown podzolic soils, hydromorphic alluvial soils, colluvial soils, brown forest soils, limeless brown forest soils and limeless brown soils. Soil map of the basin can be seen in Figure 6-19. As seen on the map, the majority of the Çekerek River Basin consist of brown soils, limeless brown forest soils and colluvial soils while alluvial soils and reddish brown soils are rarely seen in the East of Çekerek River Basin.

There is no information on regional soil contamination at CPA. On the other hand, results of surface and groundwater quality studies indicate that there is a soil contamination potential due to improper and unnecessary use of fertilizers and pesticides. Agricultural fields located at Alaca Sub-basin as well as agricultural fields located at plain sections of Çekerek Sub-basin are the potential soil contamination areas.

Wild dumps are another source of soil contamination in the region. However, there is no available information on level of soil pollution that can be linked to the dumps. Please see Figure 6-22 for location of wild dumps.



**Figure 6-19 Soil Groups in CPA**

[Access Link](#)

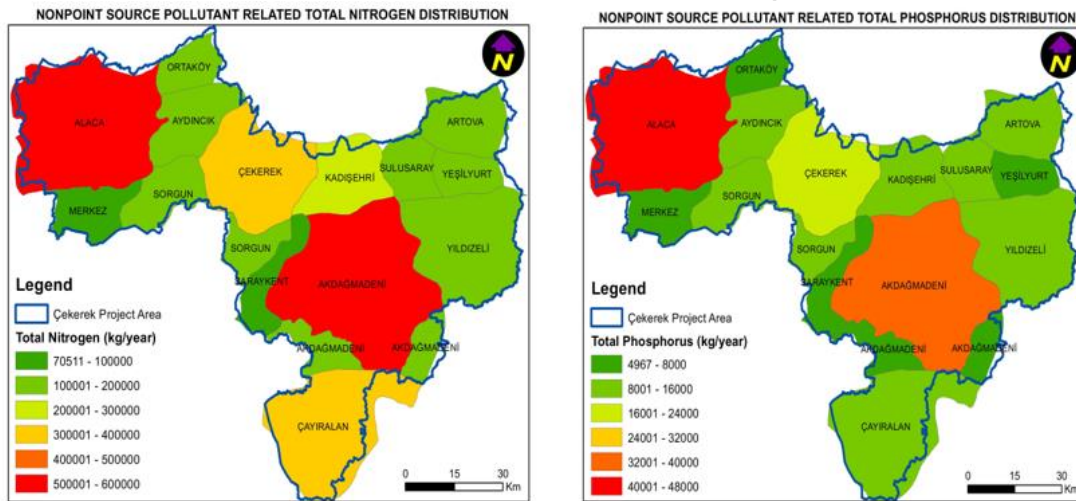
The main nonpoint sources of pollution in CPA are land use (forest areas, meadow-pasture areas, urban-rural settlements) and agricultural activities (use of fertilizers and pesticides). According to the report on the Preparation of Protection Action Plans for the Yeşilirmak Basin, the unit usage values of nitrogenous and phosphorus fertilizers used in agriculture are in the range of 10-40 kg/ha.year for nitrogen fertilizer and 0.5-0.9 kg/ha.year for phosphorus fertilizer. Although the nitrogen fertilizer value of 7.0 kg/ha. year obtained for CPA is lower than the average value; 1.2 kg/ha. year phosphorus fertilizer value is higher than the range given in the literature. This situation reveals that the use of phosphorus fertilizers in the basin should be restricted.

Animal husbandry is common in Çekerek Project Area. Some of the wastes arising from livestock activities are used as natural fertilizers in agriculture. The remaining part is stored in open warehouses under unhealthy conditions or dumped on the nearest land. As a result,

animal waste-derived nitrogen and phosphorus loads are significant contaminants entering the basin. It is seen that the total nitrogen load in the Çekerek River Basin is generally between 100-200 tons/year and the phosphorus load is between 10-20 tons/yea. These values are more than 300 tons/year for nitrogen and more than 50 tons/year for phosphorous in the provinces of Tokat and Çorum, where intensive animal husbandry takes place. The pollution loads originating from animal husbandry in the eastern part of Çekerek Basin are rarely seen (50 tons N/year and less than 5 tons P/year).

Some of the settlements in the basin are not connected to sewerage system. Therefore, cesspits (some of which are not sealed) are widely used in rural settlements. According to the report on Preparation of Watershed Protection Action Plans, the diffuses nitrogen and phosphorous values from cesspits in Çorum Province are 20-50 tons N/year and 4-8 tons P/year. Since most of the sewerage structures in Sivas, Çorum and Tokat have been completed, diffuse Nitrogen and Phosphorous load originating from the cesspits have not been observed.

As it is seen in Figure 6-20, Nitrogen and Phosphorus loads are highest in Yozgat Alaca and Akmağdeni regions.



**Figure 6-20 Nonpoint Source Pollutant Related Total Nitrogen and Phosphorus in CPA**

Source: Yeşilirmak Basin Sensitive Water Bodies Rehabilitation Action Plan, 2015

### 6.1.12. Air Quality

Air quality data for the basin is retrieved from records of air quality measurements at Sorgun station located in Yozgat. Yozgat-Sorgun Station is the only air quality measurement station located in the Çekerek Project Area. The other stations outside affecting the Çekerek basin are located in Çorum, Tokat and Sivas provinces. The air quality measurement stations in and around CPA are shown in the Figure 6-21.

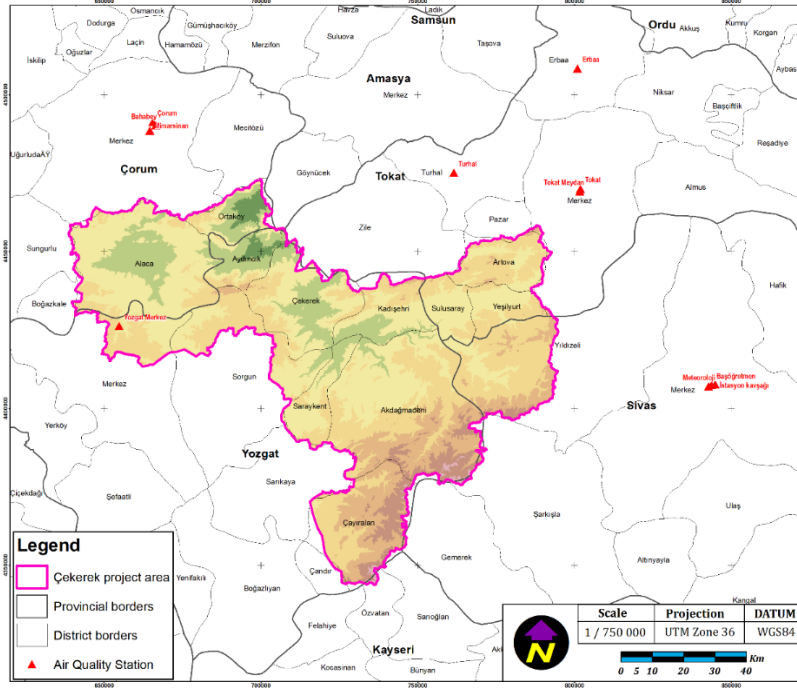


Figure 6-21 Air Quality Measurement Stations in and around CPA

[Access Link](#)

Measurements taken in these provinces have an indirect impact on the project area's air pollution. Table 6-11 gives average values of PM10 and SO2 measurements for 2019 in Yozgat-Sorgun Station.

Table 6-11 Air Quality Records in Yozgat for 2019

Months	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )
January	17	25
February	0	38
March	41	33
April	58	12
May	89	3
June	38	1
July	41	1
August	35	10
September	39	6
October	63	20
November	46	62
December	33	62
Average	41	22
Limit Values	40	20

Source: Yozgat Environmental Status Report, MoEUCC, 2019

In general, CPA provinces consist largely of rural areas, and air pollution is concentrated in the urban areas. Based on air quality records from Yozgat-Sorgun station, it is seen that SO2 values increase because of cooling of the air. In the city center, which has a cold climate,

fossil fuel is used along with natural gas. When there is no air circulation due to the geographical structure of the province, serious pollution is observed in the valley-shaped settlements.

**Table 6-12 Air Quality Records in Çorum for 2019**

Stations	Çorum		Mimarsinan		Bahabey	
Months	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	NO <sub>2</sub> (ug/m <sup>3</sup> )
January	87	36	112	43	138	113
February	57	19	85	34	95	84
March	42	16	62	-	64	100
April	29	10	58	-	45	55
May	38	9	76	39	57	63
June	36	5	67	14	49	-
July	31	3	53	19	39	-
August	32	2	52	15	41	19
September	36	3	57	20	44	106
October	49	4	90	16	69	127
November	64	18	153	19	158	220
December	50	42	73	16	88	161
Average	43	12	78	23	74	125
Limit Values	40	20	40	20	40	40

Source: Çorum Environmental Status Report, MoEUCC, 2019

As seen in the table Table 6-12, there are 3 air quality measurement stations in Çorum province. The reasons for the concentrations exceeding the air quality limit values are fossil-fuel combustion and vehicle emissions for SO<sub>2</sub>; industry, vehicle emissions, fossil fuel combustion and agricultural activities for PM<sub>10</sub>. The other reason is that the quarry (crushing-screening) facilities located above the city in the region continue to generate dust both in winter and in summer.

**Table 6-13 Air quality records in Sivas Stations for 2018**

Stations	Meteoroloji		İstasyon Kavşağı		Başöğretmen		
Months	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	NO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	NO <sub>2</sub> (ug/m <sup>3</sup> )
January	53	7	83	110	42	53	53
February	66	15	114	121	62	54	59
March	45	7	92	94	28	46	41
April	40	5	74	90	22	10	30
May	32	3	60	80	15	6	29
June	30	3	50	61	13	5	25

Stations	Meteoroloji		İstasyon Kavşağı		Başöğretmen		
Months	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	NO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	NO <sub>2</sub> (ug/m <sup>3</sup> )
July	39	2	61	63	15	5	21
August	40	2	57	63	17	8	20
September	54	3	74	71	20	8	31
October	57	20	80	64	26	13	32
November	89	48	112	70	47	19	41
December	95	61	111	68	52	27	42
Average	53	14	80	79	29	21	35
Limit Values	40	20	40	40	40	20	40

Source: Sivas Environmental Status Report, MoEUCC, 2019

As seen in table Table 6-13, high SO<sub>2</sub> values, which is the most problematic problem in Sivas city center, is generally due to heating purposes. The amount of particulate matter in the air increases due to the fuel used so increase in the emission values occurs in the winter months. Exhaust gas emission also affects air pollution. Emission values do not exceed standards except for winter months.

**Table 6-14 Air quality records in Tokat Stations for 2018**

Stations	Tokat		Tokat-Meydan		Erbaa			Turhal		
Months	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	NO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	NO <sub>2</sub> (ug/m <sup>3</sup> )	PM <sub>10</sub> (ug/m <sup>3</sup> )	SO <sub>2</sub> (ug/m <sup>3</sup> )	NO <sub>2</sub> (ug/m <sup>3</sup> )
January	37	15	63	44	91	17	45	91	24	36
February	45	15	71	47	89	16	43	90	21	37
March	60	12	82	42	85	10	40	84	12	32
April	35	7	49	27	85	6	35	85	7	26
May	28	4	42	23	49	5	24	49	4	14
June	25	3	39	37	44	6	18	44	4	15
July	29	4	39	38	39	5	15	39	5	18
August	31	2	41	44	43	6	19	43	4	22
September	30	2	45	43	43	6	17	43	5	22
October	48	3	72	37	64	5	21	64	11	22
November	-	-	65	45	75	9	31	74	9	111
December	41	14	73	42	87	11	33	85	9	141
Average	37	7	57	39	66	9	28	65	9	41
Limit Values	40	20	40	40	40	20	40	40	20	40

Source: Tokat Environmental Status Report, MoEUCC, 2019

When the exceedances of the measuring stations are examined by years, it is seen that the pollution increases especially in the winter months and the limit values determined in

the Air Quality Assessment and Management Regulation are exceeded. The PM<sub>10</sub> pollutant exceeds the limit values at all measurement stations during the winter months. Many of these excesses are thought to be caused by weather conditions (stormy days) and some of them from international dust transport.

### 6.1.13. Water Quality

In Çekerek Basin main source of water supply is groundwater which used for mainly for drinking and domestic water use; while surface water is used for mainly for irrigation.

Water quality monitoring records from various stations of DSI is given in Table 6-15 below.

**Table 6-15 Water Quality Records in Monitoring Stations**

Station name	Çekerek River Süreyyabey Dam Outlet	Germuat Creek Yıldizeli Çöte Village	Köy Creek Sulusaray Dam Outlet	Alpu Creek Alpu Dam Outlet	Büyüköz Creek - Koçhisar Dam Outlet	Çekerek River Çirdak Outlet
Water quality	Class III	Class II	Class IV	Class III	Class IV	Class III
T (°C)	12.14	14.20	12.6	13.85	17.59	15.49
pH	8.30	8.03	8.25	8.33	8.23	8.14
DO (mg/L)	9.70	7.31	8,87	8.95	7.97	9.68
COD (mg/L)	-	-	-	-	6.78	6.39
BOD (mg/L)	3.67	2.00	2.00	3.66	2.77	1.85
NH4 (mg/L)	0.84	0.33	-	0.26	0.15	0.16
NO3 (mg/L)	11.58	1.02	22,1	6.21	3.90	6.20
NO2 (mg/L)	0.02	0.01	-	0.01	0.05	0.02
TN (mg/L)	-	0.73	--	-	0.35	-
TP (mg/L)	0.22	0.13	-	0.22	0.03	0.17

Water Quality Monitoring Project Final Result Report In Çekerek Basin, DSI, 2016

In Table 6-15, Class I stands for “high quality of water”, Class II for “water with low pollution level”, Class III for “polluted water” and Class IV for “highly polluted water”. The water quality classes are defined for inland water resources in the Water Pollution Control Regulation (Official Journal dated 13.02.2008; Issue: 26786). It is seen that the surface water quality is 2nd class in the measurements made at the Germuat Deresi-Yildizeli Çöte Köyü, while the surface water quality is Class III and Class IV according to measurements made in Çekerek River-Süreyyabey Dam, Köy Creek-Sulusaray Dam Outlet, Alpu Creek-Tokat Alpu Dam, Büyüköz Creek-Koçhisar Dam.

Existing industrial and urban discharge points, urban wastewater treatment plants, wild dump sites and nitrate sensitive areas together with water quality classes of surface waters in CPA are provided in Figure 6-22.

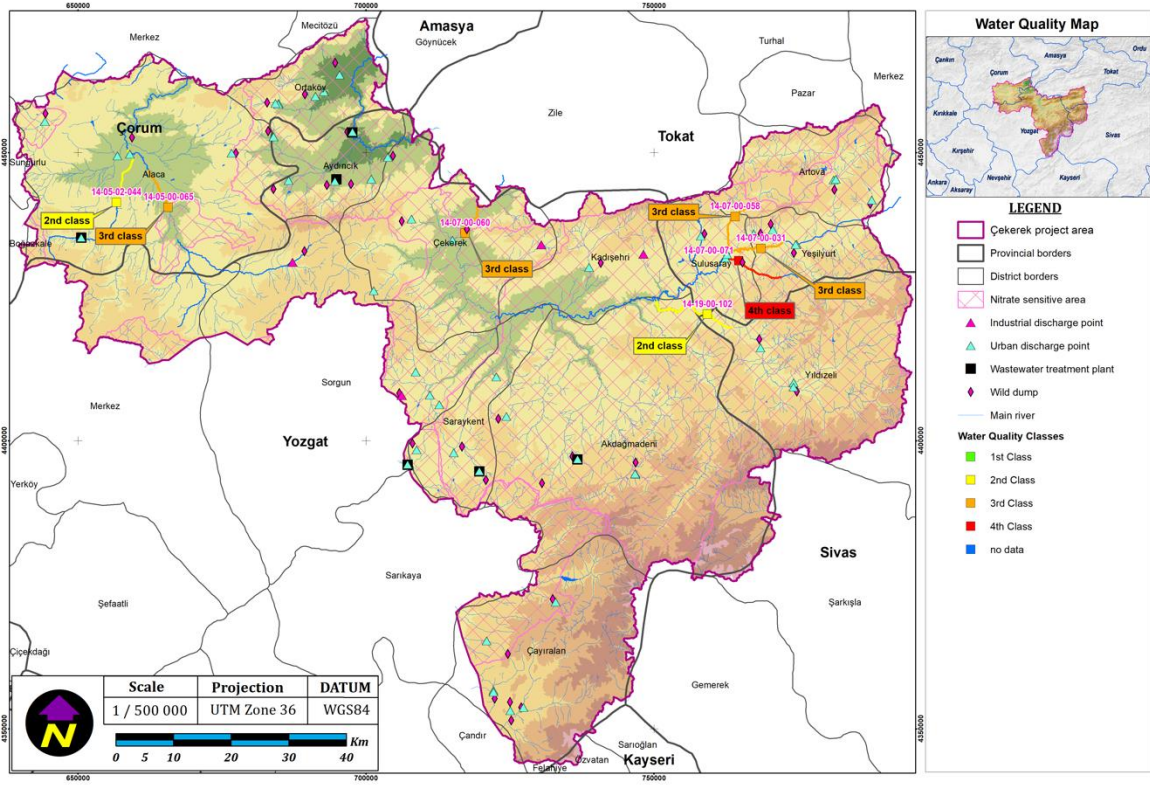


Figure 6-22 Water Quality Monitoring Stations in the CPA

[Access Link](#)

In Çekerek Basin while groundwater is generally used for irrigation, surface water is used for drinking and utility water. Information on water quality is retrieved from the DSI Report “Water Quality Monitoring Yeşilirmak Basin” is given below. Class I refers to “high quality” water quality suitable for drinking, Class II refers to “good quality” water sources with potential for drinking water; Class III water resources are polluted but can be used for industrial purpose after treatment; and Class IV refers to “weak quality” surface waters that are highly polluted.

### **Alpu Sretam**

In the measurements made on the Alpu stream in Taşova District of Amasya Province, it generally shows Class I characteristics based on DO values. The amount of nitrogen in the water increased during the summer months and the water quality is Class II according to the NO<sub>3</sub>-N, TKN, TN and color values. According to the general average of the two periods, water quality falls into Class II quality according to the amount of TKN, TN and color (436 nm).

Al (217 µg/L), Siloxane-D5 (12.4 µg/L), Fe (450 µg / L), Tridecan (7.43 µg / L) from the pollutants group and Sifluthrin in the pesticide group exceed the annual average standard limit values. The amounts of Ni and its compounds (8.15 µg / L) and Benzo (a) pyrene (0.0004 µg / L) from the priority substances group exceed the annual average standard limit values.

As a result of the analysis, coliform bacteria were identified in water. This indicates that there is an discharge of domestic and / or animal originated pollutants to the stream. Hardness of the water is classified as "hard" water in April and "medium hard" water in July.

### ***Karalar Stream***

In the measurements made on the Karalar Stream in Sivas Province, Yıldızeli District, according to the DO parameter, it was observed that the water is Class I in the April-May period, Class II in the June period, Class III in the July period. The creek dries up in the autumn and winter months.

Al (183 µg / L), Fe (339 µg / L), Zn (79.33 µg / L), Cu (7.96 µg / L) from the pollutants group, Silicium (7965 µg / L) and Beta cyfluthrin (0.004 µg / L) from the pesticide group amounts exceed the annual average standard limit values.

As a result of the analysis, coliform bacteria were identified in water. This shows that there is a domestic and / or animal source pollutant discharge to the stream. The hardness of the water is in the "hard water" class.

### ***Çakraz Stream***

In the measurements made on Çakraz Stream in Yıldızeli District of Sivas Province, it generally shows the characteristics of Class I water quality according to DO parameters. However, in July, the water quality decreased to the level of Class II. It was observed that the creek dried up in August, October and November.

Al (592 µg / L), Fe (377 µg / L), Cu (8.63 µg / L), Zn (40.4 µg / L), Silicium (6729 µg / L), V (3, 6 µg / L) from the pollutants group, and beta cyfluthrin (0.019 µg / L) in the pesticide group exceed the annual average standard limit values.

As a result of the analyzes, coliform bacteria were determined in water between April-July-February. This indicates that there is an discharge of domestic and / or animal originated pollutants to the stream. The hardness level of the water in these periods was included in the "hard water" class.

### ***Köy Stream***

In the measurements made on the Köy Stream in Sulusaray District of Tokat Province, according to the DO values, the water quality characteristics of Class I in April, Class II in May-June and Class III in July were determined.

From the pollutants group Tridecan (5.9 µg / L), Al (116 µg / L), Cu (28.4 µg / L), Siloxane-D5 (3.47 µg / L), Fe (312 µg / L) and beta cyfluthrin (0.002 µg / L) from the pesticide group exceed the annual average standard limit values.

In line with the determined pollutants, it is thought that there is an industrial and agricultural pollution in the water. Polyaromatic hydrocarbons (PAH) (0.0003 µg / L), Trichloro-methane (chloroform) (2.67 µg / L) and Perfluorooctane sulfonic acid and derivatives (PFOS) (0.0021

$\mu\text{g} / \text{L}$ ) annual average from the priority substances group exceeds the standard limit values. The hardness level of the water is in the "medium hard" water class.

### ***Maden Suyu Stream***

According to the DO parameter made on the Maden Suyu Stream in the Akdağmadeni District of Yozgat Province, the first class water quality feature was determined. However, the amount of TKN and TP in the water causes the water quality to decrease to the class II level.

Al ( $264 \mu\text{g} / \text{L}$ ), Zn ( $35.4 \mu\text{g} / \text{L}$ ), Cu ( $2.5 \mu\text{g} / \text{L}$ ), Fe ( $340 \mu\text{g} / \text{L}$ ), Co ( $0.93 \mu\text{g} / \text{L}$ ), Cr (The amounts of  $1.84 \mu\text{g} / \text{L}$ ), beta cyfluthrin ( $0.009 \mu\text{g} / \text{L}$ ) and Si ( $6953 \mu\text{g} / \text{L}$ ) exceed the annual average standard limit values. Heavy metal amounts and pesticide residue in the water suggest an industrial and / or agricultural pollution is present in the environment. Among the priority substances, Pb and its compounds ( $1.76 \mu\text{g} / \text{L}$ ) and Ni and its compounds ( $7.95 \mu\text{g} / \text{L}$ ) also exceed the annual average standard limit values. It has also been observed that there is garbage around and in the stream.

Coliform bacteria were detected in water in the periods of April-July-October-February. This indicates that there is an discharge of domestic and / or animal originated pollutants to the stream. The hardness level of the water in these periods was included in the "hard water" class.

### ***Çekerek River***

In the studies carried out on Çekerek River in Saraykent District of Yozgat Province, Class I quality feature was determined according to DO parameter. However, according to the BOD, TKN and TP parameters in the water, especially in April and July, the water quality decreases to Class II level.

Al ( $674 \mu\text{g} / \text{L}$ ), Cu ( $4,41 \mu\text{g} / \text{L}$ ), Zn ( $106 \mu\text{g} / \text{L}$ ), Fe ( $816,6 \mu\text{g} / \text{L}$ ), Co ( $1,3 \mu\text{g} / \text{L}$ ), Cr ( $10.02 \mu\text{g} / \text{L}$ ) and Si ( $10733 \mu\text{g} / \text{L}$ ) amounts exceed the annual average standard limit values. The amount of beta cyfluthrin ( $0.007 \mu\text{g} / \text{L}$ ) in the pesticide group also exceeds the annual average standard limit value. The presence of high amounts of heavy metals in the water is thought to be caused by an industrial wastewater discharge. Again, it is thought that the excess amount of silicon in the water may be caused by the sand pit located 300 m from the sampling station.

Pb and its compounds ( $1.26 \mu\text{g} / \text{L}$ ) and Ni and its compounds ( $16 \mu\text{g} / \text{L}$ ) from the priority substances group exceed the annual average standard limit values.

As a result of the analyzes, coliform bacteria were detected in water between April-July-October-February. This indicates that there is an discharge of domestic and / or animal originated pollutants to the stream. Water is in the "hard water" class in terms of hardness.

### ***Büyüköz Stream***

In the studies performed on Büyüköz Stream in Alaca District of Çorum Province, according to the DO parameter, Class III water quality feature has been determined.

According to the  $\text{NO}_3\text{-N}$  and TN values, class II quality characteristic was determined. According to other parameters, it has the first class quality feature. In the July period, similarly,

according to the amount of oil-grease, Class IV water quality values were determined. It is likely that there may be domestic and / or agricultural wastewater discharge in the region due to the properties of water in terms of organic matter and nutrients.

4-chloroaniline (0.0019 µg / L), Al (211 µg / L), Cu (24.1 µg / L), Ba (88.5 µg / L), Br (91.5 µg / L) from the pollutants group ), Zn (60.3 µg / L), Fe (280.7 µg / L), Si (4180 µg / L) and V (5.7 µg / L) exceed the annual average standard limit values.

The amounts of lead and its compounds (1.83 µg / L), Ni and its compounds (24.5 µg / L), Perfluorooctane sulfonic acid and derivatives (PFOS) (0.001 µg / L) from the priority substances group exceeded the annual average standard limit values.

As a result of the analysis, it was seen that the hardness of the water was in the "hard water" class. Coliform bacteria have been identified in the water. This indicates that there is an discharge of domestic and / or animal originated pollutants to the stream.

### ***Alaca Dam***

Alaca Dam is used for agricultural irrigation. According to DSI data, water showed Class I quality in terms of DO, TN and TP amounts in seasonal period averages.

Water is oligotrophic according to the amount of DO and chlorophyll-a in water according to seasonal periods. The high level of TN in the lake makes the trophic level hypertrophic. Again, with the Carlson Trofi Index (TSI) values calculated as a result of the studies conducted within the scope of biological monitoring, it was determined that the two measurement stations in the dam were at the eutrophic level.

### ***Artova Dam***

Artova Dam is used for agricultural irrigation. During the periods of observation, the water depth was determined to be 3.29 m - 2.81 m on average. According to DSI data, it showed Class I quality in terms of DO and TN amounts. However, due to the high TP value, the water quality falls into II. Class.

Water is oligotrophic according to the amount of DO in water according to seasonal periods. However, high TP, TN and chlorophyll-a levels of water cause the trophic level to be hypertrophic. The low depth of the antichrist disc in the lake makes the trophic level eutrophic. Again, it was determined that the Carlson Trophy Index (TSI) values calculated as a result of the studies conducted within the scope of biological monitoring were at hypertrophic.

### ***Süreyyabey Kurtağıl Dam***

Süreyyabey Kurtağıl Dam was built in the region for energy generation, agricultural irrigation water and flood protection.

In the researches carried out on Süreyyabey-Kurtağıl Dam Lake, the lake water generally showed Class II water quality according to DO and TKN parameters.

As a result of the analysis, Al (71.1 µg / L), Cu (2.3 µg / L), Zn (31 µg / L), Siloxane-D5 (0.75 µg / L), Fe (112 µg / L), Co (0.56 µg / L), Cr (1.9 µg / L), Si (3248 µg / L), nickel and their compounds (6.9 µg / L) exceeded the annual average standard limit values.

Water is oligotrophic according to the amount of DO and TP in water according to seasonal periods. However, the mean annual variation of water TN, chlorophyll-a and secci disc depth levels causes the trophic level to be mesotrophic.

### **Koçhisar Dam**

Koçhisar Dam Lake was established to obtain potable water in the region and has the status of a protection area.

As a result of the researches carried out in Koçhisar Dam Lake, the water shows Class I characteristics according to the DO parameter. DO parameter varies according to seasonal periods. Since the amount of DO in water decreases especially in summer, water quality decreases to Class III level. During the observation period, the lake water depth was measured at an annual average of 11.7 m.

High concentrations of oil-grease (0.8-1.05 mg / l) were determined in water and accordingly, water quality decreases to Class IV. Has dropped to class level. This situation may be caused by the discharge of a pollutant with a high oil-grease ratio into the water.

High amounts of metals were observed as a result of the analysis. Al (141 µg / L), Cu (14.1 µg / L), Br (45.2 µg / L), Zn (61.2 µg / L), Fe (141 µg / L) and V (6.3 µg / L) amounts exceed the annual average standard limit values. It is thought that there may be industrial wastewater discharge in the region due to the properties of water in terms of these pollutants in the lake water and the high oil-grease ratios.

In terms of annual average values in the priority substances group, lead and its compounds (1.40 µg / L), nickel and its compounds (7.1 µg / L), Benzo (a) pyrene (0.00023 µg / L), Trichloro-methane (chloroform) (7.28 µg / L) and Perfluorooctane sulfonic acid and derivatives (PFOS) (0.001 µg / L) have exceeded the annual average standard limit value.

It was observed that the amount of solids dissolved in water was high. Again, sulfate, chlorine and sodium values in water increase the amount of salt. The lake water is “hard” water according to its hardness. Coliform bacteria were identified in water in July, October and 2018-February periods. This indicates that there may be domestic and / or animal sourced pollutant discharge to the lake.

### **6.1.14. Biodiversity**

There are a number of legally protected nature conservation areas and elements with high biodiversity value, within Çekerek Basin<sup>11, 12</sup>. These include, Kadıncınarı and Oluközü Nature

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<sup>11</sup> Ministry of Environment, Urbanization and Climate Change, Natural SITE Areas of Turkey, 2020. <https://www.csb.gov.tr/sit-alanlari/arama>

<sup>12</sup> Ministry of Agriculture and Forest, General Directorate of Nature Protection and Natural Parks, Protected Areas of Turkey, 2020. <https://www.tarimorman.gov.tr/DKMP>

Parks in Akdağmadeni district of Yozgat and Ulukavak Nature Monument in Çekerek district of Yozgat (Table 6-16 ).

**Table 6-16 Legally protected areas within Çekerek Project Area**

No	Type of Area	Name of the Area / Asset	Type / Location
1	Nature Park	Kadınarı	Akdağmadeni
2	Nature Park	Oluközü	Akdağmadeni
3	Nature Monument	One monumental white poplar tree	Kamışçık Village (Çekerek)

General Directorate of Nature Protection and National Parks (GDNPNP) is the main responsible state agency to identify and protect the biodiversity of Turkey. GDNPNP has been conducting province level biodiversity surveys to determine the distribution of critical species and habitats<sup>13</sup>. Çekerek Basin extends throughout four provinces: Yozgat, Tokat, Sivas and Çorum. For each of these provinces, GDNPNP has completed the biodiversity surveys and produced a ‘Final Report of the Terrestrial and Inland Water Ecosystems Biodiversity Inventory and Monitoring Work’ for each of these four provinces. These studies have specific formats with outputs on:

- Species diversity data and maps (plants, mammals, birds, inland fish, reptiles, amphibians, invertebrates),
- Indicator species from each species group and their monitoring plans,
- Current threats and conservation suggestions on species and habitats,
- European Nature Information System (EUNIS) habitat maps of the provinces,
- A synthesis of the distribution of biodiversity in the province, which defines ‘Special Biodiversity Areas’, that include:
  - Habitats with High Target Species Diversity,
  - Priority Plant Community Areas,
  - Priority Wildlife Areas.

The final reports and accompanying digital data and maps should be used to evaluate the presence of critical habitats for each sub-project using the guideline provided as a flowchart in Annex 7 and avoidance, mitigation and monitoring should be undertaken through preparation of Biodiversity Management Plans, if critical habitats and/or nationally recognized conservation areas are present.

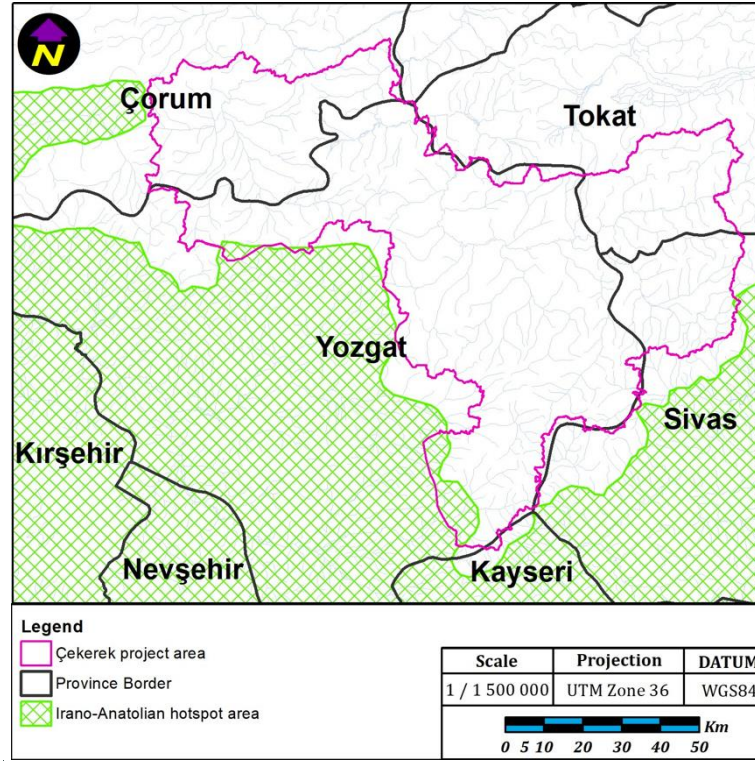
A pilot study on determining the Natura 2000 sites in Central Anatolian Region of Turkey was conducted and completed in 2018 by GDNPNP. The results of this study, which are summarized in a publication<sup>14</sup> by GDNPNP indicates that one Natura 2000 Special Protected Area is determined in Akdağmadeni district, overlapping with the Çekerek Basin. This is not yet a legally protected area but is one of the 34 conservation-priority sites determined for the Central Anatolia within Natura 2000 framework. It is stated in this introductory document that, each of these priority areas contain four critical habitats, and 14 priority species, on average,

<sup>13</sup> Ulusal Biyolojik Çeşitlilik Veri Tabanı, 2020. Noah’s Arc Biodiversity Database. <http://www.nuhungemisi.gov.tr/Projects/Ubenis>

<sup>14</sup> Fernandez-Velilla, S.C., Alvarez, J.M., Ortego, I.P. 2018. *Selection of Natura 2000 Areas Using Systematic Conservation Planning: A Methodological Proposal for Turkey*. Technical Aid to Strengthen the Nature Conservation System for the Implementation of Requirements of Natura 2000 (EuropAid/134319/IH/SER/TR). (in Turkish)

according to Union norms. Additionally, 42 EUNIS habitat types were defined within the Project area.

Three of the 36 biodiversity hotspots of the world have extensive regions in Turkey<sup>15</sup>. These are Mediterranean Basin, Irano-Anatolian and Caucasus hotspots. Çekerek Basin project area has a minor overlap with the Irano-Anatolian biodiversity hotspot (see Figure 6-23).



**Figure 6-23 Çekerek Project Area and Irano-Anatolian Biodiversity Hotspot**

Additionally, there are national assessments on the regional biodiversity hotspots of Turkey, which are Key Biodiversity Areas of Turkey<sup>16</sup>, Important Plant Areas of Turkey<sup>17</sup>, Important Bird Areas<sup>18</sup>, Priority Butterfly Areas of Turkey<sup>19</sup> and Systematic Conservation Planning of Black Sea Region and Anatolian Diagonal<sup>20</sup>. The nearest national hotspots and legally protected areas in Çekerek Basin project area are shown in Figure 6-24 and their distances to the project area are given in

<sup>15</sup> Critical Ecosystem Partnership Fund, 2020. <https://www.cepf.net/our-work/biodiversity-hotspots>

<sup>16</sup> Eken, G., Bozdoğan, M., İsfendiyoğlu, S., Kılıç D.T., Lise, Y. (ed.) 2006. *Key Biodiversity Areas of Turkey*. Nature Society, Ankara. (in Turkish).

<sup>17</sup> Özhatay, N., Byfield, A., Atay, S. 2003. *Important Plant Areas of Turkey*. Association for the Protection of Nature.

<sup>18</sup> Kılıç, D.T., Eken, G. 2004. *Important Bird Areas of Turkey – 2004 update*. Nature Society, Ankara, Turkey. (in Turkish).

<sup>19</sup> Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız and G. Welch. 2011. *Conservation Strategy for Butterflies in Turkey*. Nature Conservation Centre, Ankara, Turkey.

<sup>20</sup> Turak, A., Balkız, Ö., Ambarlı, D., Durmuş, M., Özkil, A., Yalçın, S., Özüt, D., Kınıkoğlu, Y., Meydan Kocaman, T., Cengiz, S., Albayrak, F., Kurt, B., Zeydanlı, U., Bilgin C. 2011. *Systematic Conservation Planning of Black Sea Region*. Nature Conservation Centre, Ankara. (in Turkish).

Table 6-17.



**Table 6-17 Distance of the Legally Protected Areas to CPA**

No	Protected Area	Distance to Çekerek Project Area (km)
1	Davulbaztepe Nature Park	5
2	Üçtepelere Nature Park	12
3	Yozgat Fatih Nature Park	7.8
4	Yozgat Çamlığı National Park	7.8
5	Boğazköy-Alacahöyük National Park	0.5
6	Kaz Lake	9
7	Seyfe Lake	1
8	Tokat Kaz Lake Wildlife Protection Area and Nationally Recognized Wetland	7
9	Yenipazar Key Biodiversity Area and Important Bird Area	19
10	Priority Conservation Areas of Anatolian Diagonal Systematic Conservation Plan	0.5 – 12

Within Çekerek Project Area, three Key Biodiversity Areas (KBA) are present: Ballica Hills KBA, Kazankaya Valley KBA, and Akdağmadeni Forest KBA. Kazankaya Valley KBA is also an Important Bird Area (IBA). As listed in the site evaluations of KBAs and IBA, the critical species and habitats reported in these are listed in Table 6-18.

**Table 6-18 Critical Species and Habitats found in KBAs and IBA within CPA<sup>21</sup>**

No	Type	Name	Species Group	Species / Habitats	IUCN Thrat Category*	Endemicity	Distribution
1	Key Biodiversity Areas	Akdağmadeni Forests	Plants	<i>Campanula pulvinaris</i>	EN	Endemic	Local endemic
			Habitats	Scots pine forests, mixed with oak and juniper	-	-	-
2		Ballica Hills	Plants	<i>Salvia reeseana</i>	VU	Endemic	-
			Mammals	<i>Rhinolophus mehelyi</i>	VU	-	-
3		Kazankaya Valley	Plants	<i>Scorzonera ekimii</i>	CR	Endemic	-
			Birds	<i>Neophron percnopterus</i>	EN	-	-

<sup>21</sup> Eken, G., Bozdoğan, M., İsfendiyaroğlu, S., Kılıç D.T., Lise, Y. (ed.) 2006. *Key Biodiversity Areas of Turkey*. Nature Society, Ankara. (in Turkish).

No	Type	Name	Species Group	Species / Habitats	IUCN Thrat Category*	Endemicity	Distribution
			Mammals	<i>Lutra lutra</i>	NT		
4	Important Bird Areas	Kazankaya Valley	Birds	<i>Gyps fulvus</i>	LC	-	-

\* IUCN Threat Categories: LC: Least Concern, NT: Near Threatened, VU: Vulnerable, EN: Endangered, CR: Critically Endangered

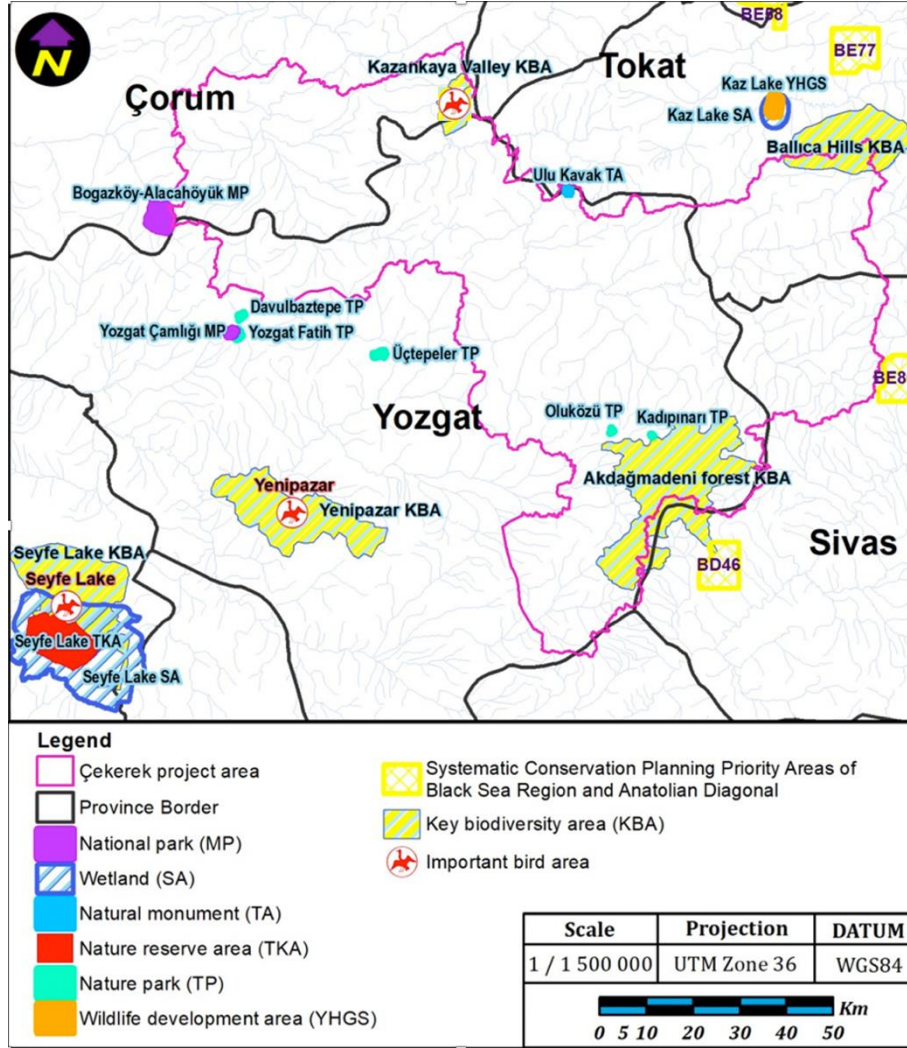


Figure 6-24 Biodiversity Hotspots and Protected Areas in and around CPA

The existing literature may be insufficient to evaluate the presence of critical habitats in Çekerek Project Area, since the project area is in vicinity of the Irano-Anatolian Hotspot, where steppe ecosystem dominates, harboring numerous rare, threatened, endangered and endemic plant species. Therefore, for those sub-projects that fall especially within the steppe ecosystem of the Çekerek basin project area, field surveys on the flora should be conducted by botanists within and near the sub-project local study area.

Çekerek Project Area does not contain any legally protected or nationally recognized wetland areas. However, during the field visit that took place on 22-25 September 2020, two wetland areas were visited near Sulusaray district, namely Uyuz Lake and Tuz Lake wetlands. The

responsible engineer from GDNCNP Tokat Provincial Department informed that, Uyuz Lake and Salt Lake were important sites for the common crane (*Grus grus*) (LC) besides other water birds. Uyuz Lake is observed to be under threat of water retake for irrigation of neighboring farmlands, as it was totally dry and drainage channels were observed. Salt Lake has become more like a marshland due to drainage channels built by State Hydraulic Works (DSİ) in the past years. These two lakes are not listed as officially recognized wetlands by the GDNCNP, although they may constitute critical habitats for the local and migratory bird species as personal communication with the officer for the Tokat National Parks Department, who informed on the presence of these two lakes, suggested that these lakes provide habitat for the migratory birds, according to his field observations (

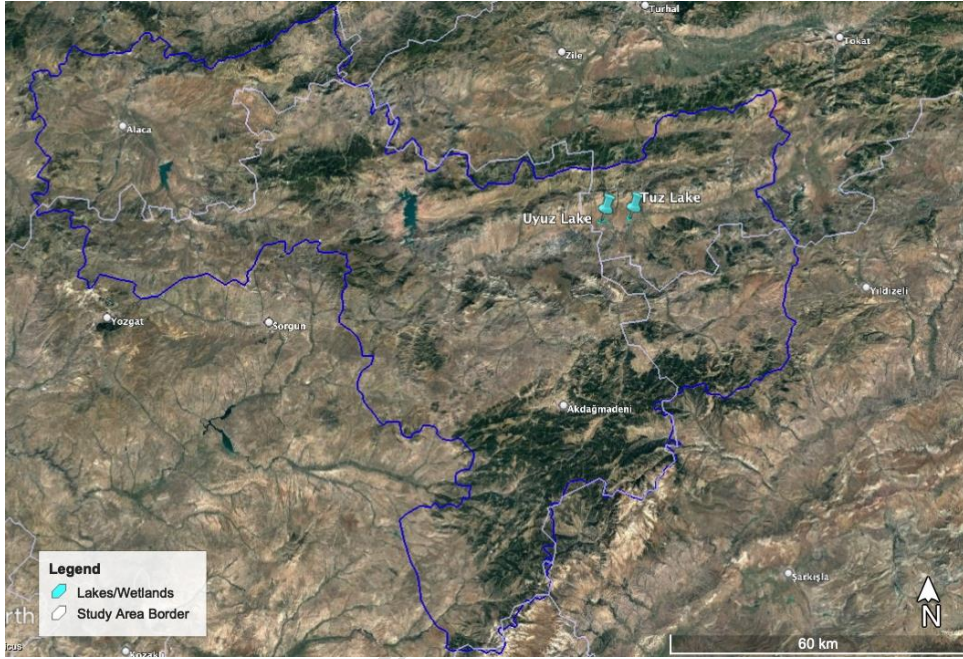
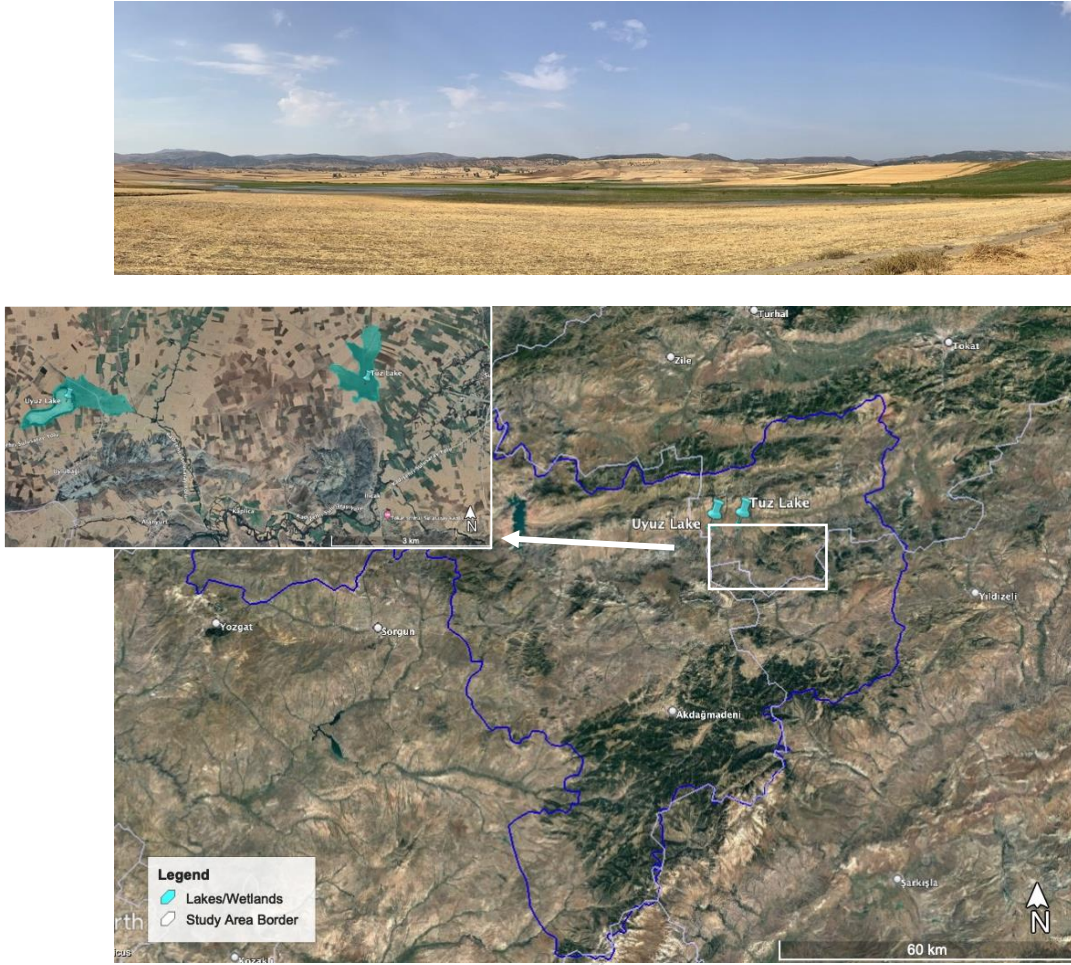


Figure 6-25).





**Figure 6-25 Uyuz Lake (Photos 1 and 2) and Tuz Lake (Photo 3) and locations within CPA**

A guideline is available as a flowchart in Annex 7, which should be used by the managers of each sub-project to evaluate the presence of protected areas, nationally and internationally recognized conservation areas and critical habitats within the local study footprint area and additional affected areas. As a result of this evaluation, the necessity of preparing a Biodiversity Management Plan for the given sub-project should be assessed, which will be presented as an assessment report.

### **6.1.15. Environmental Infrastructure and Services**

#### ***Urban Sewerage System***

94% of Yozgat's population as of 2018 has access to the urban sewerage system of the Yozgat Municipality. In addition, all of the wastewater collected by the sewerage system (approximately 18,000 m<sup>3</sup>/day) is treated in the wastewater biological treatment plant of the Yozgat municipality and discharged to Baltaözü Creek. Yozgat Municipality Wastewater Biological Treatment Plant was commissioned in 2006 and the capacity of the facility is 24,000 m<sup>3</sup>/day. The population it serves is approximately 76,863 people. The amount of treated wastewater

discharged is 0.210 m<sup>3</sup>/sec. The amount of sewage sludge formed at the facility is 1.2 tons/day. The sewage sludge formed is disposed to the Yozgat Municipality Sanitary Landfill.

Tokat Central Municipality has a total sewage system of 482.95 km in 2016. The population receiving sewage service corresponds to approximately 98% of the total population of 148,149. As the central municipality, the Wastewater Treatment Plant was put into service in 2010. Food, textile, garment, brick and forestry based industries are founded in Tokat. There are wastewater treatment facilities of wastewater originating from food and mining sectors. Organized industrial zone welded wastewater is treated in wastewater treatment facilities of Tokat and Erbaa Municipalities.

As of 2018, there is 1390 km sewerage network and 122 km rainwater network in the center of Çorum Province. Çorum province has not had a sewage requirement for many years and new sewer lines are being built for new settlements. Sewerage service is provided to 99.5% of the population living in the Province. A very small population that cannot receive sewerage services is businesses that have their own treatment system. There is a wastewater treatment plant in the Province where 100% of the wastewater generated is treated.

While approximately 95% of the population received service in 2000 with the urban sewage system in Sivas province, in 2018, almost 100% of the population was served. In 2018, wastewater treatment facility services were provided by Sivas Municipality, Gürün, İmranlı and Şarkışla Municipalities.

Please refer to Figure 6-22 for the location of WWTPs in the districts in CPA and please see Table 6-19 below for their current state and technology.

**Table 6-19 Current status of the wastewater treatment plants**

Province	District	WWTP Available		WWTP Type	
		Available	Planned / Under Construction	Physical	Biological
Yozgat	Yozgat Center	X			X
	Aydıncık	X		X	
	Sorgun		X		X
	Çekerek		X		
	Kadıışehri		X		X
	Saraykent		X		X
	Akdağmadeni		X		
	Çayıralan		X		
Tokat	Artova		postponed		X
	Sulusaray		not in use		X
	Yeşilyurt		X		
Çorum	Alaca		X		
	Ortaköy		X		
Sivas	Yıldızeli		X		

Source: Provincial Environmental Status Report, Environment and Urbanization Provincial Directorate (2018)

### **Solid Waste Landfill Facilities**

Solid wastes are disposed of in the sanitary landfill of Yozgat Municipalities Union, which was put into service in 2007. Solid wastes in the province are collected by the municipalities in waste bins, transported by trucks and sent to the sanitary landfill. However, some municipalities still continue to uncontrolled waste disposal. In Tokat Province, the existing surface area of the sanitary landfill located in Sulakbeli District is 44,770 m<sup>2</sup> and the planned surface area is 134,445 m<sup>2</sup>. Total storage volume is currently 783,000 m<sup>3</sup>. However, there is no sanitary landfill yet established in Çorum center and its districts. Lastly, sanitary landfill in Sivas Province is located at Seyfebeli Haçın Deresi at 12th km of Erzincan Highway. It has been started to operate as of the end of 2014.

There are still wild dumps being used in CPA, which municipalities are gradually closing by rehabilitating and restoring for environmental safety. Location of wild dumps can be seen in Figure 6-22 in Section 6.1.13.

### **Power Plants**

There are 7 hydroelectric power plants in CPA, with the purpose to generate energy. The regulators are built to regulate the water flow. Çekerek HES 1 generates 14,4 MW power, Incesu HES generates 15 MW energy and Çekerek 2-3-4-5 generates 3,58 MW.

### **Irrigation Systems**

The following irrigation systems are currently in operation :

- Kazova, Artova, Niksar, Kazova, Dutluca, Bedirkale, Büyükaköz and Omala irrigation systems in Tokat
- Ahmetođlan, Alaca, Sincan, Evcieneniřla, Geykoca, Geven, Halkaçayır, Hıdırlık, Ahmetođlan and Pınarlı irrigation systems in Çorum
- Halkaçayır Pond Irrigation system in Sivas
- Hořumlu and Sarımbey Irrigation systems in Yozgat

### **Other Facilities**

Other investments in CPA with approved EIA Reports between 2016-2021 are as follows:

- 154 kV power transmission line, Çekerek and Sorgun Districts, Yozgat
- Marble Quarry in Aslandođmuş Neighborhood, Yıldızeli District, Sivas
- 154 kV power transmission line Merkez and Yıldızeli District, Sivas
- 154 kV (Sorgun-Yozgat) power transmission line, Central District, Yozgat
- 154 kV Electric power transmission line, Çekerek and Sorgun Districts, Yozgat
- Iron Mine and Crushing-Sieving Plant, Saraykent District, Yozgat

- Topaz Wind Power Plant; Alaca, Aydıncık and Sorgun Districts Çorum,
- Limestone Quarry and Crushing and Screening Plant, Nebişeyh Neighborhood, Reşadiye District, Tokat
- Beyyurdu Wind Power Plant; Çekerek and Sorgun Districts, Yozgat
- Çekerek Basin Electric Power Transmission Line; Alaca, Aydıncık, Çekerek and Sorgun Districts; Çorum, Yozgat
- Mining and Crushing-Sieving Plant, Karadikmen, Akdağmadeni District, Yozgat
- Solvent Recovery Plant, Yerköy District, Yozgat
- Kaya granite quarry, Gözbaba Neighborhood, Sorgun District, Yozgat

## 6.2. Socio-Economic Baseline

The topics related to social characteristics will be examined under six headings and these include:

- Demographics and migration
- Welfare and livelihoods
- Agricultural Production
- Quality of life and living conditions
- Social Relations
- Vulnerable groups

### 6.2.1. Demographics and migration

#### ***Population characteristics on the basis of settlement***

As indicated in the Environmental Baseline Section, CPA boundaries are located in four different provinces, namely, Çorum, Sivas, Tokat and Yozgat.

The population of Çorum province for the year 2020 is 530,126 (TukStat, 2020). The province is comprised of 14 districts where 759 villages are located. The largest district by population size is the Central District (299,315) while the smallest is Boğazkale (3,648) (TukStat, 2020).

The population of Sivas province is 635,889 and 75.2% live in districts and the city center (TurkStat, 2020). The population density is 109 in the central district. There are 28 people per km<sup>2</sup> in the province (the population density is 109 in the central district). The annual population in the province has decreased by 0.5%. The district with the highest increase in population is the Central district (1%). The district with the highest decrease in population is Doğanşar (-16.4%) (TukStat, 2020). According to TurkStat data (February, 2020), there are 17 districts, 23 municipalities, and 1,233 villages.

According to TurkStat data, the population of Tokat province is 597,861 and 66.7% of this population lives in districts and city center (end of 2020). The area of the province is 10,044 km<sup>2</sup>. There are 61 people per km<sup>2</sup> in the province (the population density is 100 in the central district). The annual population in the province has decreased by 2.5%. The district with the highest increase in population is Reşadiye (6.54%). The district with the highest decrease in population is Pazar (-7,01%) (TurkStat, 2020). According to the TurkStat data (February, 2020), there are 12 districts, 37 municipalities, 315 neighborhoods and there are 613 villages in these municipalities.

The population of Yozgat is 419,095 and 65.8% of this population lives in districts and city center (end of 2020). The area of the province is 13,690 km<sup>2</sup>. There are 31 people per km<sup>2</sup> in the province (the population density is 53 in the central district). Compared to 2019 data, the annual population in the province has decreased by 0.5%. The district with the highest increase in population is the Central district (1.06%). The district with the highest decrease in population is Saraykent (-12.06%) (Tukstat, 2020). According to the data of Turkish Statistical Institute (TurkStat, February 2020), in Yozgat there are 14 districts, 36 municipalities, 234 neighborhoods and also there are 558 villages in these municipalities.

According to administrative segregation of provinces and districts, majority of the population lives in urban areas (Please see Table 6-20).

**Table 6-20 Rural / Urban Population Distribution in CPA Provinces**

Province	Rural/Urban (%)	City/District center (%)
Yozgat	24.19	75.81
Tokat	21.35	78.65
Çorum	36.85	63.15
Sivas	23.33	76.67

Source: TurkStat, 2019

In general, the population of the CPA is in a continuous and rapid decrease. In line with the data collected and reviewed during preparation, it can be concluded that the main reason for this trend might be the migration from CPA provinces to other provinces. Over the years, there has been a change in the spatial distribution of the population: the rural population has decreased rapidly due to migration, and the population in the city and district centers have remained unchanged. The main reason for migration is fragmentation of agricultural lands, mechanization, inefficiency and inadequacy of social services, as is the case throughout Turkey. It is observed that the rural population first migrated to the city center. Being unable to find what they were looking for in the city center, they migrated to other provinces. If Yozgat continues to lose its population at the same rate of previous years, this ratio is expected to be -42.47 in 2023 (ORAN, 2019).

Table 6-21 below provides the population change in the basin provinces between 2008 and 2019 and compares this rate of change with population of Turkey for the same period. It can be seen that while the population in the country has been increasing constantly since 2008, the population in CPA provinces has been decreasing continuously.

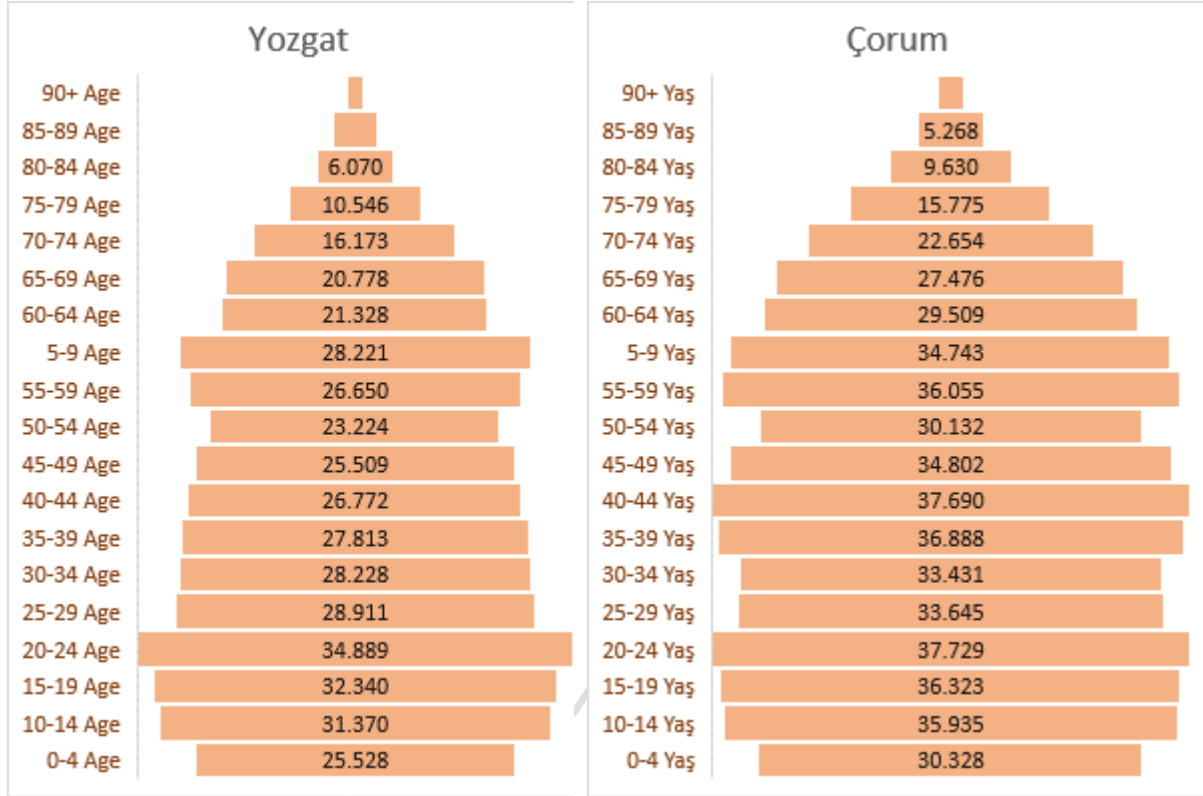
**Table 6-21 Population in CPA Provinces During 2008 - 2020**

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
2008	71,517,100	545,444	631,112	617,158	484,206
2009	72,561,312	540,704	633,347	624,439	487,365
2010	73,722,988	535,405	642,224	617,802	476,096
2011	74,724,269	534,578	627,056	608,299	465,696
2012	75,627,384	529,975	623,535	613,990	453,211
2013	76,667,864	532,080	623,824	598,708	444,211
2014	77,695,904	527,220	623,116	597,920	432,560
2015	78,741,053	525,180	618,617	593,990	419,440
2016	79,814,871	527,863	621,224	602,662	421,041

<b>2017</b>	80,810,525	528,422	621,301	602,086	418,650
<b>2018</b>	82,003,882	536,483	646,608	612,646	424,981
<b>2019</b>	83,154,997	530,864	638,956	612,747	421,200
<b>2020</b>	83,614,362	530,126	635,889	597,861	419,095

Source: TurkStat

Population age pyramids in the provinces within the CPA are as follows (TurkStat, 2020).



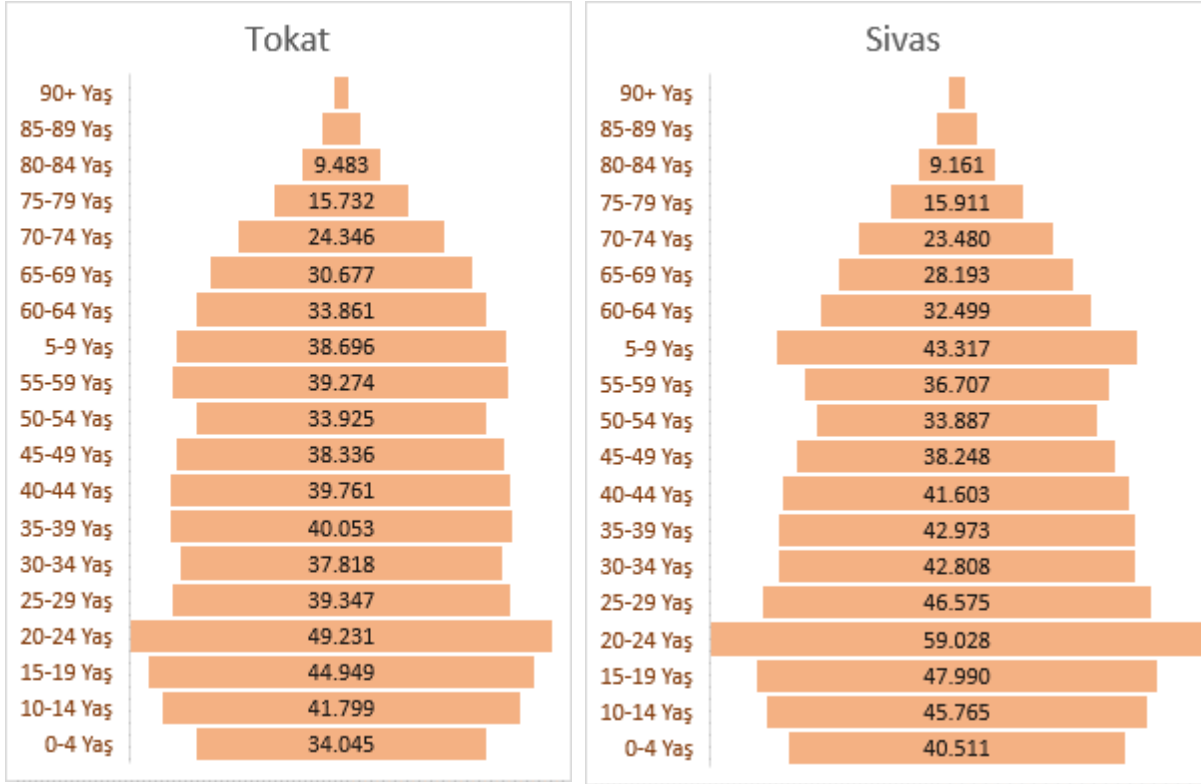


Figure 6-26 Population pyramids of provinces within the CPA

#### Population Change

In line with the data given above in Table 6-21, the population increase in Turkey and decrease in the CPA provinces the annual population growth per thousand population between 2018 and 2019 have been in minus for the most years in the provinces of the CPA. Out of 12 years under review here the population growth was positive for all the CPA provinces only in 2018 (Please see Table 6-22 for details).

Table 6-22 Annual Population Growth Rate of the CPA Provinces (%)

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
2008	13.1	-8.01	-10.9	-6.46	-16.23
2009	14.5	-8.73	3.59	11.67	6.5
2010	15.88	-9.85	14.08	-10.89	-23.39
2011	13.49	-1.55	-23.9	-15.5	-22.09
2012	12.01	-8.65	-5.63	9.31	-27.18
2013	13.66	3.96	0.46	-25.2	-20.06
2014	13.32	-9.18	-1.14	-1.32	-26.58
2015	13.36	-3.88	-7.25	-6.59	-30.8
2016	13.55	5.1	4.21	14.49	3.81
2017	12.4	1.,06	0.12	-0.96	-5.69
2018	14.66	15.14	39.92	17.39	15.01
2019	13.94	-10.53	-11.9	0.16	-8.94
2020	5.5	-0.14	-0.48	-2.43	-0.50

Source: TurkStat

According to TurkStat 2020 data, the population density (number of people per square kilometer) for all the cities in the CPA are well below Turkey's average (109). The province with the lowest population density in the CPA is Sivas (22), followed by Yozgat (30), Çorum (41) and Tokat (59) (Please see Table 6-23).

**Table 6-23 Population and Population Density of the Provinces in the CPA**

Province	Population	Population density (population/km <sup>2</sup> )
Yozgat	421,200	30
Tokat	612,747	59
Çorum	530,864	41
Sivas	638,956	22

Source: TurkStat, 2019

According to the data of TurkStat (2019), when the birth places of the people registered in the the provinces in the Çekerek Project Area are examined, it is seen that the majority of the residents were born in the provinces of the Project Area, but around 10% of the population was born outside the province (see Table 6-24). In other words, the provinces in the CPA have been receiving a small portion of migrant people from other places outside the CPA and in line with the data/information reviewed, it can be concluded that this migration was most likely to be an outcome of the family union due to marriages.

**Table 6-24 Ratio of Births in the Provinces**

Province	Population of the Province	Population born in the province	Ratio of province births to the total population (%)
Yozgat	421,200	368,591	87.51
Tokat	612,747	529,877	86.57
Çorum	530,864	477,252	89.90
Sivas	638,956	576.453	90.22

Source: TurkStat, 2019

When the population characteristics of the cities and their districts that fall under CPA are considered, according to the data of TurkStat (2007-2020), it is seen that there was a slight increase in 2018. However, except for the central district all settlements of Yozgat that fall under the CPA had been losing population between 2007-2020 (See Table 6-25).

**Table 6-25 Population Change in Districts of Yozgat in CPA**

Years	Akdağmaç deni	Aydıncık	Çayıralan	Çekerek	Kadışehir	Merkez	Saraykent	Sorgun
2020	42,407	9,967	12,457	19,415	10,768	104,079	12,651	80,525
2019	42,621	10,079	12,563	19,467	11,227	106,280	12,486	79,533
2018	42,919	10,407	13,512	19,786	11,716	105,167	14,198	79,314
2017	43,070	9,811	12,390	19,583	11,739	103,965	12,722	78,369
2016	43,826	9,870	12,735	20,680	12,021	101,426	13,172	78,133
2015	44,326	10,089	13,073	20,857	12,768	98,248	12,909	78,178
2014	47,309	10,936	14,201	22,729	13,397	96,831	14,192	79,580
2013	48,249	12,585	14,985	23,699	14,578	97,443	15,134	81,231
2012	49,442	11,065	16,092	25,441	15,154	97,094	15,620	82,944
2011	50,591	11,347	18,040	26,810	15,530	96,350	18,046	84,591

2010	53,065	11,560	18,637	27,690	15,971	95,667	17,392	87,518
2009	52,624	11,813	20,757	28,352	16,452	95,853	18,511	89,209
2008	53,789	12,558	20,318	28,799	16,914	94,972	18,705	85,831
2007	54,530	12,618	22,053	30,463	17,976	95,275	19,607	83,931

Source: TurkStat, 2020

According to the data of TurkStat (2007-2020), when the populations of the districts that are part of Tokat province and where the settlements under the CPA are located, it is seen that between 2007 and 2020 apart from the Central district all other districts had been losing population constantly. There was a minor population change against this general tendency, but these were isolated instances (see Table 6-26 for further details).

**Table 6-26 Population Change in Districts of Tokat in CPA**

Years	Artova	Sulusaray	Yeşilyurt
2020	8,132	7,083	8,871
2019	8,374	7,598	8,969
2018	8,744	7,401	9,154
2017	8,503	7,576	9,133
2016	9,275	8,610	9,402
2015	8,752	8,442	9,565
2014	9,106	7,835	10,291
2013	9,384	8,455	11,458
2012	9,450	8,838	11,785
2011	9,805	8,914	11,359
2010	10,022	9,071	11,556
2009	10,220	9,297	11,610
2008	10,770	9,863	11,817
2007	11,073	9,595	11,921

Source: TurkStat

According to the data of TurkStat (2007-2020), when the populations of the districts that are affiliated to Çorum and included in the CPA between 2007-2020 are examined, a stable population loss is noticeable in Alaca district and some fluctuations are observed in the population of Ortaköy district. As can be seen in Table 6-27, there was a population increase of 1000 people in Ortaköy district of Çorum in 2008, but the next year the population fell below the previous year and continued to decrease afterwards. The population of Ortaköy showed some changes over the years but the general tendency was decline of its population since 2008 (See Table 6-27).

**Table 6-27 Population Change in Districts of Çorum in CPA**

Years	Alaca	Ortaköy
2020	31,264	6,691
2019	31,121	7,069
2018	31,460	8,696
2017	31,594	6,848
2016	32,017	7,573

2015	32,669	8,371
2014	33,468	8,155
2013	34,677	8,430
2012	35,324	8,090
2011	36,840	8,124
2010	37,985	8,646
2009	38,628	9,491
2008	39,738	10,725
2007	40,770	9,711

Source: TurkStat, 2020

According to the data of TurkStat (2007-2020), a rapid and stable population decrease had been observed in Yıldızeli district of Sivas between 2007-2020. In Sivas only Yıldızeli district and its villages fall under the CPA. Despite a small population increase in 2018 the general tendency in the province was steady decrease of the population (See Table 6-28).

**Table 6-28 Population Change in Districts of Sivas in CPA**

Years	Yıldızeli
2020	31,748
2019	32,787
2018	33,986
2017	33,486
2016	34,860
2015	35,980
2014	38,735
2013	40,540
2012	42,723
2011	43,639
2010	45,041
2009	47,228
2008	51,031
2007	52,710

Source: TurkStat

Table 6-29 below provides information about the crude birth rate (‰) in the provinces of the CPA and Turkey in general between 2009 and 2019. Overall the crude birth rate<sup>22</sup> had been on the fall in all provinces of the CPA and in Turkey over the last 10 years. However, this fall is more dramatic in the provinces of the CPA. The average rate in Turkey had fallen from 17.6 in 2009 to 14.3 in 2019. This fall was from 14,7 to 11,1 in Çorum; from 16.7 to 12.5 in Sivas;

<sup>22</sup> The birth rate is the rate found by dividing the number of live babies born in a year by the mid-year population and multiplying by 1000. It gives the birth rate per 1000 population in a year proportionally.

from 15.1 to 10,9 in Tokat; and from 17.7 to 11.8 in Yozgat, this province also recorded the highest rate of fall in crude birth rate within the provinces of the CPA for the same period.

**Table 6-29 Crude Birth Rate (‰) in CPA (2009-2019)**

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
2009	17.6	14.7	16,7	15.1	17.7
2010	17.2	14.2	16	14.6	16.1
2011	16.9	13.7	15,5	13.6	15.5
2012	17.2	14.1	15.6	13.2	15.1
2013	17	13.4	15	13.2	14.5
2014	17.5	13.7	15.1	13	15
2015	17.1	12.7	14.9	12.2	14.7
2016	16.6	12.6	14.6	11.9	14
2017	16.2	12	14.4	11.5	13.9
2018	15.4	11.5	13	11.2	12.8
2019	14.3	11,1	12.5	10.9	11.8

Source: TurkStat

Total fertility rate refers to the average number of children a woman can give birth in the 15 and 49 age group, when she is supposed to be fertile. The total fertility rate had been falling down gradually between the years of 2009 and 2019 in Turkey in general and in the provinces of the CPA in particular. However, as can be seen from Table 6-30 this rate of fall is more dramatic in the provinces of the CPA compared to the average of Turkey.

**Table 6-30 Total Fertility Rate in CPA (2009-2019)**

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
2009	2.10	1.93	2.07	1.95	2.25
2010	2.08	1.9	2.02	1.92	2.07
2011	2.05	1.86	1.99	1.83	2.04
2012	2.11	1.96	1.99	1.79	2.03
2013	2.11	1.89	1.94	1.82	1.98
2014	2.19	1.97	1.99	1.83	2.08
2015	2.16	1.85	1.98	1.74	2.08
2016	2.11	1.87	1.95	1.7	1.99
2017	2.08	1.8	1.93	1.66	1.97
2018	2.00	1.74	1.78	1.63	1.81
2019	1.88	1.68	1.71	1.6	1.67

Source: TurkStat

From the outset it might come as a surprise that despite a drastic fall in the population; crude birth rate, and in the total fertility rate in the CPA provinces, the number of households in the basin provinces had been increasing since 2012 (see Table 6-31 for further details). This even becomes more surprising that the crude marriage rate in the CPA provinces had also been declining since 2001.

**Table 6-31 Total Number of Households in CPA (2012-2019)**

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
2012	19,842,850	156,200	163,349	165,080	119,626
2013	20,489,721	159,963	167,335	163,197	121,293
2014	21,091,075	162,355	172,033	168,557	123,118
2015	21,662,260	164,469	172,038	170,700	123,202
2016	22,206,776	166,692	174,640	174,906	124,765
2017	22,676,186	168,702	175,762	176,494	125,511
2018	23,221,218	171,705	184,539	180,641	128,205
2019	24,001,940	173,532	185,050	185,960	129,928

Source: TurkStat

In line with the observations made during the field study and the data reviewed during the preparation of this report, it can be concluded that the increase in the number of households might be related with the households traditionally including extended families vertically (different generations) and horizontally brothers and sisters even cousins from the same generations (married brother remaining in the same households) in the same households. This trend has been changing by traditional households being divided into households that include only nuclear families. Another impact in the increasing number of the households is that elderly people do not migrate from the provinces of the CPA as much as the younger generations. One of the reasons for the increasing number of households is increased incidence of elderly people living by themselves, without extended families. This creates a high proportion of vulnerable elderly people living in households in the CPA just by themselves (see Table 6-32 for further details).

**Table 6-32 Crude Marriage Rate (‰) in CPA (2001-2019)**

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
2001	8.35	11.33	11.09	10.1	12.12
2002	7.73	9.85	9.13	8.31	10.04
2003	8.47	10.78	10.04	9.64	11.7
2004	9.1	11.52	10.54	10.38	13.54
2005	9.37	12.1	11.09	10.3	13.71
2006	9.18	11.12	10.71	9.56	14.12
2007	9.1	10.88	10.39	9.43	13.47
2008	9.04	10.04	9.87	9.02	12.56
2009	8.21	9.04	8.52	8.41	10.85
2010	7.97	8.86	7.9	7.69	10.03
2011	7.99	8.19	7.9	7.77	9.57
2012	8.03	8.12	7.99	7.35	9.66
2013	7.88	7.97	7.67	7.46	9.18
2014	7.77	7.54	7.67	7.07	9.25
2015	7.71	7.56	7.61	7.07	9.1
2016	7.5	6.93	7.21	6.51	8.57
2017	7.09	6.81	6.7	6.52	8.16

2018	6.81	6.74	6.52	6.6	7.75
2019	6.56	6.57	6.27	5.91	7.52

Source: TurkStat

### Migration

According to the data of TurkStat (2007-2020), the migration rate of the provinces within the CPA shows that they generally tend to lose population (See Table 6-33).

**Table 6-33 Net Migration Rates (‰) of Provinces in CPA (2008-2019)**

Years	Çorum	Sivas	Tokat	Yozgat
2020	1.17	-8.45	-27.88	-8.3
2019	-13.88	-19.92	-0.06	-17.05
2018	7.77	30.76	8.30	7.64
2017	-6.91	-10.49	-6.64	-10.51
2016	-7.05	-5.46	5.31	-9.66
2015	-12.02	-13.14	-10.42	-27.91
2014	-16.51	-8.2	-4.75	-26.29
2013	-8.21	-6.22	-32.99	-22.01
2012	-13.72	-9.5	4.76	-21.56
2011	-13.5	-11.49	-11.06	-24.75
2010	-15.56	-12.22	-24.88	-27.83
2009	-16.56	-8.44	-2.49	-15.96
2008	-15.00	-18.15	-10.15	-30.04

Source: TurkStat

According to the data of TurkStat (2019); when destinations of migrants from the provinces in CPA are considered, a major fraction of migrants from Çorum, Tokat and Yozgat provinces migrated to Ankara. In 2019, more than 10 thousand people migrated to Ankara from the provinces of Çorum and Yozgat. The number of immigrants from Sivas and Tokat to Ankara was slightly below 3,000. Other popular destinations include Kayseri, İzmir and Bursa. The number of people immigrating from Çorum, Sivas, Tokat and Yozgat to other major provinces is presented in Table 6-34.

**Table 6-34 Number of Migrants from Provinces in CPA to Other Major Cities (2019)**

Migrant receiving cities	Migrant sending cities			
	Çorum	Sivas	Tokat	Yozgat
Ankara	11,698	2,842	2,855	10,524
Kayseri	111	2,923	360	2,750
İzmir	823	2,112	1,243	1,052
Bursa	528	805	1,011	1,443
Antalya	668	1,213	672	783
Kocaeli	391	724	1,293	450
Tekirdağ	181	301	1,272	265
Samsun	486	411	921	198

Source: TurkStat, 2019

According to the data of TurkStat (2021), the number of people living in big cities, whose population records are in provinces within the CPA, is also high. The number of people registered in Yozgat who lives in İstanbul is 151,916 and people living in Ankara is 389,435. Most strikingly the number of people living in İstanbul that are registered in Sivas is 767,428 and the number of people living in Ankara again from Sivas is 160,883 according to the TurkStat's Address Based Population Registration System (ABPRS, 2021 ). It is seen that 499,026 people registered in Tokat live in İstanbul and 371,150 people registered in Çorum live in Ankara (See Table 6-35).

**Table 6-35 Migrant Population in İstanbul and Ankara with Records in CPA Provinces<sup>23</sup>**

City	Yozgat	Tokat	Çorum	Sivas
İstanbul	151,916	484,463	178,867	767,428
Ankara	389,435	75,701	423,098	160,883

Source: TurkStat, 2019

According to the data of TurkStat (2019), if the migrants are examined in terms of their education level, it is seen that education level of the migrants living in the provinces within CPA is higher than the average of Turkey. This situation shows that migration causes a qualitative loss (i.e. more skilled people) as well as quantitative, and that human capital of the CPA remain low in terms of education quality and skill. It is observed that migrant men are mostly high school/equivalent vocational school graduates, a similar tendency is observed among women, but in Sivas, the number of high school or faculty graduates is higher than high school/equivalent vocational school graduates amongst migrant (See Table 6-36).

**Table 6-36 Education Level of the Migrant People (15 years and older) (2019)**

Level of Education	Çorum	Sivas	Tokat	Yozgat
<b>Male</b>				
Illiterate	57	141	61	41
Literate but without formal education	106	230	183	102
Elementary school	821	2,464	1,838	3,695
Primary education	714	993	1,620	713
Secondary school or equivalent	1,457	2,077	2,973	1,682
High school	3,607	4,807	5,629	3,695
University	2,086	3,404	3,371	2,616
Postgraduate	173	360	282	241
Doctorate	29	49	44	30
Unknown	103	137	58	114
<b>Female</b>				
Illiterate	336	994	429	303
Literate but without formal education	303	758	581	308

<sup>23</sup> Their family records are in the address-based system and it is cumulative in nature because of the time span (i.e. people might migrate in the 1950s to İstanbul and might have children and grandchildren still registered in the province of their birth despite new generations being born in İstanbul. Because the birth registration follow paternal ancestral lines unless it is moved to the city of residence by application).

Level of Education	Çorum	Sivas	Tokat	Yozgat
Elementary school	1,320	2,632	2,831	1,570
Primary education	616	721	1,335	639
Secondary school or equivalent	1,371	1,800	1,270	1,533
High school	3,789	4,550	4,982	3,477
University	2,471	4,855	3,949	2,703
Postgraduate	154	333	327	2,703
Doctorate	12	33	32	19
Unknown	130	151	76	145

Source: TurkStat

The biggest reason for the decrease in the CPA population is the rapid migration of the rural population. This is mainly rooted in the decrease in the monetary return of the economic activities in rural areas, and the lack of employment. Loss of yield in agricultural production and the shrinkage of arable lands through inheritance over time accelerated the withdrawal from agriculture. The state subsidies have been inefficient in solving this problem as the payments addressed landowners rather than real farmers actively involved in agriculture. Given that the vast majority of the cultivated lands in CPA are mainly rented by active farmers on seasonal basis, this arises as a significant issue, further elaborated in following sections.

The effect of national and international policies of agriculture in Turkey, reinforced the long-term downward trend in agricultural employment. It has been expected that in the next 10 years this shift will continue. In this case, the expectation of an increase in the disintegration in the agricultural sector, which triggers the migration phenomenon with the shift from agriculture to the service and industrial sector in the next 10 years, requires additional measures to be taken in the region and especially in the CPA, which has a socio-economically dependent structure, for women and other disadvantaged groups. Throughout the country, agriculture has traditionally been carried out as a small family business, unpaid family labor is widespread, and the education level of the population working in agriculture is relatively low. Besides the unregistered and hidden unemployment feature of the agriculture, the decrease in the rural population that has occurred have led to the uncontrolled disintegration in agriculture in the CPA since 2001 and one of the social cost of this trend is rising poverty and unemployment. These aspects will be analyzed further in the coming sections.

Social studies show that the migration tendency of the CPA people is also very high. According to Yozgat Social Profile Survey carried out by Central Anatolia Development Agency (2016)<sup>24</sup>, the rate of the participants willing to migrate if they have had the opportunity was 47.9%. Almost half of the population tends to migrate, which indicates that it is a serious risk factor for Yozgat. When asked why they want to migrate, participants stated their reasons for migration; to live in a place where living conditions are better (32%), to live in a place with more job opportunities (27.3%), to live in a place where social life is more developed (26.9%), for better education opportunities for their children/themselves (14.5%). Among the reasons for migration, the socio-economic disadvantages of Yozgat stands out. The fact that social life is not developed

<sup>24</sup> Yozgat Social Profile Survey, Central Anatolia Development Agency, 2016

much and tendency to migrate, indicate that the economic development potential of the province is also under a great risk.

According to the Sivas Social Profile Survey carried out by Central Anatolia Development Agency (2016)<sup>25</sup>, the rate of participants willing to migrate if they have had the opportunity was 37.5%. Reasons for people who wanted to migrate included 34.9% being in a place where social life is more developed, 32.5% being in a place where living conditions are better, 29.3% being in a place with more job opportunities, 12% better education for their children/themselves 9.3% would like to be in a place where them and their family would receive better health services, 5.6% would like to be somewhere closer to their relatives and children. Most of the reasons for people who wanted to migrate were related to Sivas's social disadvantages. When considered as a whole, social life, living conditions and job opportunities are seen having impact on the outgoing migration from Sivas. These problems are felt more especially in the rural areas where migration rate is very high.

#### *Age dependency*

The age dependency ratio, is the ratio of the number of dependents aged 0-14 and over 65 years (economically non-active population) to the total population aged 15 to 64 (economically active population). The proportion of the elderly population has increased due to migrations in CPA. The low fertility rate in the basin also has an impact on this increase.

It is seen that the districts in the CPA have a high rate of elderly population. This is why activities aiming to attract young people to the region and rural areas will be important within scope of TULIP. In the table below, the total population of the districts, the population over 65 years and the ratio of the population over 65 years to the total population are presented. Accordingly, the population over 65 years of age in all districts (except for Yozgat Central) constitutes more than 10% of the total population. This ratio is around 15% in Çekerek district of Yozgat and Yıldızeli district of Sivas. This ratio as exceeded 17% in Aydıncık district of Yozgat and Artova district of Tokat. In two districts of Çorum, the ratio of people over 65 years is much higher; 22.8% in Ortaköy and 18.5% in Alaca (Table 6-37 below).

**Table 6-37 Share of Population Aged 65+ in District Population in CPA (2019)**

District	Province	Total Population	0-14 Age group		15-64 Age group		65 + Age group	
			Population	%	Population	%	Population	%
Akdağmadeni	Yozgat	43,070	9,732	22.59	28,214	65.50	5,124	11.89
Aydıncık	Yozgat	9,811	2,184	22.26	5,886	59.99	1,741	17.74
Çayıralan	Yozgat	12,390	1,808	14.59	8,098	65.35	2,484	20.01
Çekerek	Yozgat	19,583	4,262	21.76	12,435	63.49	2,886	14.73
Kadışehir	Yozgat	11,737	2,858	24.35	7,498	63.88	1,383	11.78
Merkez	Yozgat	103,635	21,985	21.14	72,150	69.80	9,830	9.45
Saraykent	Yozgat	12,722	3,017	23.71	8,297	65.21	1,408	11.06
Sorgun	Yozgat	78,369	19,323	24.65	50,514	64.45	8,532	10.88
Artova	Tokat	8,374	942	11.31	5,936	71.20	1,496	17.86

<sup>25</sup> Sivas Social Profile Survey, Central Anatolia Development Agency, 2016

Sulusaray	Tokat	7,598	1,302	17.11	5,324	70.07	972	12.79
Yeşilyurt	Tokat	8,969	1,397	15.57	6,449	71.90	1,123	12.52
Alaca	Çorum	32,669	4,463	13.66	22,649	69.32	5,557	17.09
Ortaköy	Çorum	8,371	1,092	13.04	5,776	69.00	1,503	17.95
Yıldızeli	Sivas	32,797	6,884	20.98	21,202	64.64	4,711	14.36

Source: TurkStat

Considering the migration figures of the CPA provinces by age group, it is seen that the migration of the young and middle age population is higher, while the migration rate is lower among the elderly population. Therefore, it appears that the age dependency ratio of the Basin is increasing.

### ***The current population characteristic in CPA***

Community Level Questionnaire (CLQ, 2020) was answered by 177 muhtars of the settlements in CPA. According to these responses the number of permanently living households in the settlements varied between 5 to 700. The average number of households per settlement was 62. Muhtars were also asked about the permanent populations of their settlements. The settlements with the smallest population has 10 people and the largest has 1,680 people. The average number of people per settlement was 236.

In addition to the permanent population, the settlements in the CPA periodically experiences temporary population increase due to internal and international migrants from the area returning back to their settlements on holiday times which is usually in the summer and although in lower numbers also in harvest times. Household numbers with temporary residence varied between 2 and 350. The average number of households per settlement in this category was 37. As far as the temporary population in the settlements were concerned, this varied between 2 and 1,570. The average number of temporary population per settlement was 146. As emphasized, the average number of permanent population was 236 and temporary population was 146. From these averages it can be estimated that an average of 62% of population increase per settlement in the CPA during summer months and harvest periods.

During the implementation of the CLQs, the muhtars were asked about the population change during the last 5 years in their settlements. Table 6-38 indicates that for the 24% of the settlements a population increase were reported. However, 42% of the settlements reported population decrease. For the 32% of the settlements there were no change in their populations.

**Table 6-38 Population Change in the Settelements During Last 5 years**

Direction of population change	Frequency (N)	% Change
Increased	45	24.4
Decreased	75	42.4
Unchanged	57	32.2

Source: Çekerek Field Study (CLQ), 2020

Muhtars were also asked for the reasons of the population change in their settlements. The reasons for the population increase in settlements included:

- High level of living expenses in big cities
- Economic crises making urban life difficult
- Life being much cheaper in villages
- Tendency to return to the village after retirement

The reasons for population decrease included:

- For economic reasons, insufficient agricultural livelihoods
- Young people's search for jobs with social security
- The city offers better employment opportunities
- Inadequate social facilities such as education and health in rural areas
- Drought and inefficiency

CLQ also revealed the substantial nature of the periodic, temporary migration from the CPA settlements. Eighty two (82%) out of 97 settlements' muhtars reported temporary migration from their settlements. The majority of these temporary migrants went to Ankara and Istanbul and 90% of them worked in construction industry as laborer. Again 90% of them stayed away around six month in a year. There were also some women and children amongst these temporary migrants and they mainly worked in agriculture as wage laborer.

## 6.2.2. Welfare and Livelihoods

### Structure of Livelihood Sources

In this section structure of livelihood sources such as agriculture and animal husbandry, industry, mining, forestry and tourism in the impacted provinces will be reviewed. Although the place of Agriculture and Livestock in livelihoods is mentioned in this section, the agricultural potential of CPA will be examined in more detail under 6.2.3 *Agricultural Production in CPA*.

#### *Agriculture and Animal Husbandry*

In Yozgat, whose economy is largely based on agriculture and animal husbandry, grain production under continental climate conditions is dominant. Among agricultural products, wheat, barley, lentils, chickpeas and beans occupy a large part of the arable land. Sugar beet production is made in wetlands. Fruit and vegetable production in the province is mostly for domestic consumption. Therefore, the need for vegetables and fruits is met from other provinces. However, with the dams, ponds and small irrigation facilities built for irrigation in recent years, it is aimed to expand irrigated agriculture and increase vegetable production in the province. The important agricultural areas of Yozgat are in Sorgun, Boğazlıyan, Yerköy, Sarıkaya and Şefaati districts and agricultural production is high here. Accordingly, the population of these areas is also dense. In addition, sahlepe (a flour made from the tubers of the orchid genus, used in beverages and desserts) is produced in Akdağmadeni. Due to the harsh climatic conditions and the lack of storage areas, vineyard-orchard agriculture has not developed enough. In these lands, generally vegetables such as green beans, cucumbers, tomatoes, peppers and fruits such as apricot, plum, sour cherry, cherry, apple, quince, pear, and green melon are produced.

One of the most important economic activities of Yozgat is animal husbandry. The city has a great potential in terms of animal husbandry. Ovine and cattle breeding is widespread in the city due to the wide area of pastures and the widespread vegetation of the steppe.

Today, the economy of Tokat province is largely based on agriculture and agriculture-based industry. The majority of the adult population works in the agricultural sector. Agricultural lands constitute 37% of the province's surface area. In addition to having three different climatic structures, altitudes vary between 150 meters and 2200 meters. Irrigated agricultural areas constitute 30% of the agricultural areas. Kazova, Turhal, Erbaa, Niksar, Artova and Zile plains can be irrigated to a large extent. There are 67,398 large and small agricultural enterprises in the province. Plant production is at the forefront in 44% of the enterprises, and animal

production in 56% (Plant Production Data TurkStat 2018). The ecological conditions of the province allow for product diversity, second crop and winter vegetable cultivation.

Greenhouse agriculture practices (greenhouse cultivation), which contribute significantly to vegetative production in the province, are becoming widespread. In 2017, 19,346 tons of greenhouse vegetables and fruits were grown in Merkez, Erbaa, Niksar, Turhal, Pazar and Zile districts. Vegetables produced by greenhouse cultivation include; tomatoes, peppers, lettuce, cucumber, eggplant, green beans, onion, parsley, cress, arugula and dill. In 2017, 14.6 million pieces of ornamental plants such as carnation, gladiolus, gerberas, gypsophilla, chrysanthemum, lily, rose, lisianthus and goldenrod were grown in the province. Some ornamental plants grown in the province are in the top ten in our country in terms of production amount.

A significant amount of animal products are obtained from dairy cattle, beef cattle, beekeeping and trout farming activities in its rich flora. In 2017, over 300 thousand tons of milk was produced from the small and bovine livestock activities in the province. The share of milk obtained from milk fattening in the country is 1.5%. More than 500 tons of honey is produced annually through beekeeping activities.

45% of the total area of Çorum is suitable for agriculture. Only 15% of the arable land is irrigable agricultural land. The scarcity of irrigable agricultural land affects agriculture negatively. Therefore, the rate of the population in rural areas is 28%. City hold a significant place in grains, especially wheat (2.3% of Turkey's production). The north of the province, especially in the production of rice and Kargı Osmançik highlighted (7% of Turkey's production). This product alongside chickpeas, onions, sugar beets are other important agricultural products. In terms of livestock, although small ruminant livestock is common, it is not significant. Egg poultry has developed in the province.

According to the records of the General Directorate of Population and Citizenship Affairs, Turkey's most villages are located in Sivas (1,233 in numbers). Yıldızeli is the only district in Sivas province included in the CPA and it is 50 km away from the center. The area of the district is 3,326 km<sup>2</sup>. The harsh continental climate is seen in the district. In the west of the district, there is rich vegetation and arable land. The highest mountain in the district is Yıldız Mountain (2,552 m). The vegetation is mostly steppe. There are forest areas in the north.

Table 6-39 shows the available agricultural land in Turkey and in the provinces of the CPA between 2004 and 2019. It can be seen that in Turkey almost 25% of the agricultural land had been lost in the period mentioned here. In the basin the only province experiences similar loss was Yozgat and the reduction of the agricultural land in Çorum was 13%. However there were no significant reduction of agricultural area in Sivas and Tokat.

**Table 6-39 Total Agricultural Area (ha) in CPA (2004 – 2019)**

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
2004	23,812,992	591,076	789,586	296,906	792,016
2005	23,775,459	591,111	795,764	299,747	759,566
2006	22,981,020	575,652	707,766	288,726	740,469
2007	21,978,693	565,836	677,260	287,050	724,190
2008	21,555,242	554,736	550,406	287,362	720,435
2009	21,351,696	551,151	1,056,933	284,340	639,041
2010	21,383,626	598,478	956,168	289,830	733,696
2011	20,522,626	572,463	727,221	294,435	743,104

2012	20,581,039	553,433	769,235	300,976	692.413
2013	20,573,477	542,157	795,344	289,342	591.409
2014	20,697,903	538,356	805,994	298,207	616.690
2015	20,649,766	543,046	817,974	294,500	615.767
2016	20,381,943	524,375	797,644	286,949	597.798
2017	19,998,498	526,032	790,038	292,493	592.189
2018	19,723,076	512,570	777,141	287,564	605.283
2019	19,580,744	520,281	787,079	292,266	609.254

Source: TurkStat

### Industry

Yozgat is located at the intersection of roads connecting east to west and north to south. The historical Silk Road passes through here. Despite these, the city has not developed enough in terms of industrialization and fell behind the big cities around it. Yozgat Organized Industrial Zone (OIZ) is important for employment. Here, a total of 31 facilities continue to produce and 1,718 people are employed. In the OIZ; there are companies specializing in areas such as textile, plastic, construction, metal, boiler, health, agriculture, machinery, food and packaging, marble-granite, and the manufacture of military equipment (Yozgat Ekonomik Görünüm, 2019)

Turhal is one of Turkey's first sugar factory with the establishment of the factory in the 1930s Tokat witnessed the state led industrialization process. However, no progress has been made in the industry, except for the Almus Dam and hydroelectric power plants built in the 1960s, the Cigarette Factory, which became operational in 1983, and a few small businesses belonging to the private sector. Agriculture-based industry has developed in Tokat with the facilities established by the public and private sector. Turkey's first fruit juice manufacturer which is one of the Turkey's top 500 companies established a major plant in 1985. Companies operate in 127 parcels in Tokat Organized Industrial Zone. The number of registered people working in the OIZ was 3,988 as of December 2018. Approximately 80% of the employment is provided by the facilities manufacturing clothing. (Yozgat Ekonomik Görünüm, 2019).

According to Provincial Directorate of 2017, 8,539 people are employed in 2,590 workplaces in various small industrial sites scattered throughout the province of Tokat. The sectors with the highest employment rate throughout the province are the garment industry with 48% (2,590 workplaces and 8,539 employees), the stone and earth-based industry with 17% (45 workplaces and 2,034 employees) and the food industry with 13% (95 enterprises, 1522 employees) (Science Industry and Technology Tokat Provincial Directorate, 2017). Although there is an airport close to Tokat, the fact that there are only Istanbul flights, the inadequacy of the railways and the distance to important trade centers have prevented the economy of the province from reaching the desired level. This situation negatively affected job opportunities and accelerated the migration out of the province.

The industry of Çorum has developed generally depending on the soil and agriculture. The feed, flour, brick and tile industry stands out in the city center. Especially tile and brick factories played a pioneering role in the economic development of the city, and 40% of Turkey's tile consumption, 10% of the consumption of brick is provided from factories located in the province. In addition, the cement factory contributed to the city's economy until it ceased production. The sugar factory also played a major role in the development of the city.

**Table 6-40 Industrial Establishments and Labour Force in Çorum (2018)**

Industrial Sectors	Number of Establishment	Labour Force
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Based on Stone and Soil	148	4,994
Forest Products and Tree Based	286	1,105
Machinery Metal	289	4,576
Food stuff	250	3,256
Textiles	49	4,186
Chemicals, Plastic	65	883
Paper	19	629
Others	68	934
Total	1,174	20,563

Source: Çorum OSB, 2018

Sivas Turkey Railway Machines Industry Inc. (TÜDEMSAŞ), Sivas Concrete Sleeper Factory, Sivas Cement Factory, Sivas and Divriği Iron and Steel Works, the Kangal Thermal Power Plant, Camshaft Factory, Aselsan Precision Optical Factory, lens factory, marble factory, flour and there are important industrial establishments such as animal food factories, furniture factories, textile factories are located in the province. The industrial facilities in Sivas make a contribution to the city economically and also in terms of labor opportunities. However, due to a very limited employment opportunities, immigration from Sivas to the regions where industry is more developed continues.

### *Mining*

Yozgat is a city rich in underground resources. Uranium, iron, coal in Sorgun district; lead, silver, copper and zinc in Akdağmadeni district; gold in Boğazlıyan district, salt deposits in Yerköy district, fluorite in Yerköy and Şefaati districts, limestone in Şefaati district are among the important mines. Many of these underground resources are used as raw materials and also contribute to the economy by being processed in different cities. These mines are effective in increasing the population density in the areas where they are located. Sorgun district is an example of this. The province is also important for natural stones such as quartz, chalcedony, agate, amethyst (purple ruby), jasper, kyanite, fluorite, hematite (speculate), and tourmaline. Amethyst stone extracted in Aydıncık district is used for jewelry, ornaments and decoration purposes and contributes to economy and employment.

Metallic mines and mines that are industrial raw materials are extracted in Tokat. Antimony, copper, iron, chrome, manganese and nickel are among the metallic mines extracted in the province; aspest, bentonite, kaolin, clay, limestone and marble are among the mines that are industrial raw materials extracted in the province. Among these mines, marble, bentonite, antimony and hard coal stand out. According to the researches, it is stated that 40% of the world's marble reserves are located in Turkey and approximately 20% of this reserve is in Tokat (Tokat Province Sectoral Action Plans 2018).

Mineral production in Çorum is not diverse and rich. The most important underground mine production is lignite coal. Especially Dodurga district has developed with lignite coal production. In addition, although various mineral reserves have been identified, production has not yet been realized.

### *Forestry*

Forests cover 18,2% of the territory of Yozgat. It is concentrated in Akdağmadeni, Aydıncık, Çandır, Çayıralan, Çekerek, Kadışehri and Saraykent. There is almost no forest cover in Boğazlıyan and Yenifakılı districts.

Tokat province is rich in forest assets. There are 420 thousand hectares of forest and 56 thousand hectares of heathland. Valuable cedar wood, hornbeam, spruce, fir, ash, wild olive, oak and beech are found in the forests. Willow and poplar trees dominate the valleys. In the province 290 villages are in the forest and 164 villages are on the forest edge. 40-500 m<sup>3</sup> of industrial wood and 369,000 sterling firewood are obtained each year.

The forest area in Çorum is not at the desired level. While forest areas are very low in the central and southern parts where annual precipitation is low, the areas covered with forest are high in the northern parts of the Black Sea climate characteristics, especially in Kargı district. Accordingly, the timber industry has developed in these parts. See Figure 6-27 for the forest villages map.



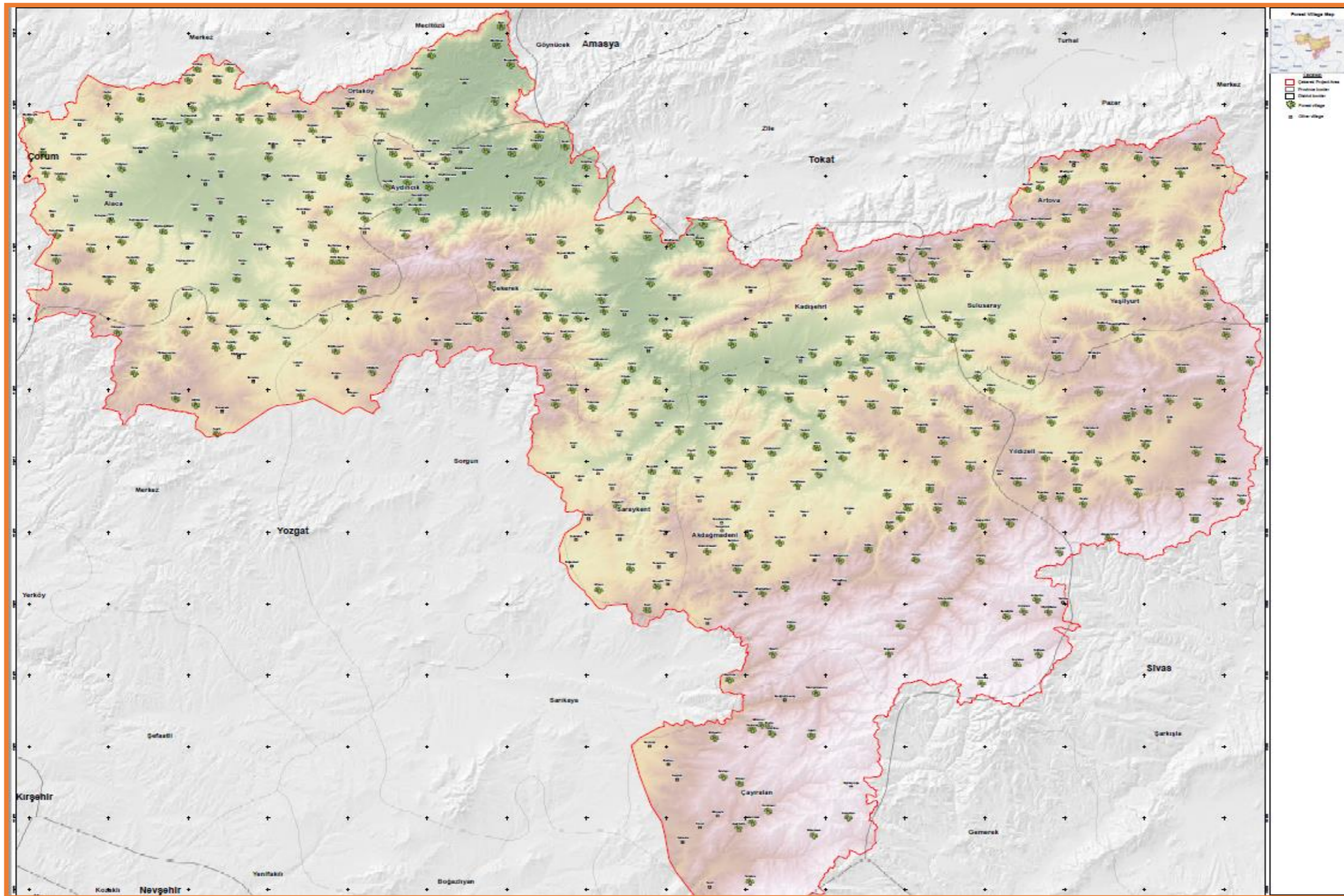


Figure 6-27 Forest Villages Map [Access Link](#)

### Tourism

Tourism and related services (i.e. hotels restaurants, transport and so on) are important contributors to the livelihoods of people in the CPA. The location of Yozgat on the E 88 highway and especially its proximity to Hattusas (the capital of the Hittite Civilization), and the fact that the Atatürk road connecting Hattusas and Cappadocia passes through the city center makes the city important for tourism. Yozgat, also known as Bozok Plateau, has been inhabited since the First Ages. It is one of the cities to be visited with its unspoiled nature, promenade places, high plains, historical, cultural, touristic values and thermal springs.

The ruins of the ancient city of Sebastapolis in Sulusaray, one of the five largest cities of the Black Sea on the east-west and north-south route during the Roman period and the rich ancient city with the authority to coin money, and the autonomous city of Komana, which was the religion and trade center of the Kingdom of Mithridate in Northern Anatolia survived until today. Zile is one of the oldest settlements in Anatolia. In Tokat, where there are 510 items registered by the Regional Directorate of Cultural and Natural Heritage Preservation, 262 of these works are examples of civil architecture, 117 of them are religious buildings, 70 of them are cultural buildings, 16 of them are natural assets, 4 of them are commercial building and 1 military building. There are 112 archaeological sites, 3 urban sites, 2 natural sites and 1 historical site in the province with 118 protected areas.

Especially, Alacahöyük, which is one of the first human settlement areas in Anatolia, Hattusa, the capital of the Hittites, and Sapinuva, which is a kind of trade center of the Hittite State, are located in the province of Çorum. Tourism has not developed much in Çorum. The number of foreign tourists visiting the province in 2018 is around 110 thousand.

### **Structure of Employment**

The main reason for the rural-dominated out-migration in the CPA referred to in the previous section is the decline in the livelihood support level of the rural economic activities and the lack of employment opportunities. Therefore, unemployment is highly pronounced in the region, although there are no reliable data on the unemployment rate of the region. İŞKUR data in this respect provides some ideas. Those who are registered as unemployed in İŞKUR are those who do not work in any income generating job but apply to İŞKUR for job search. Therefore, these numbers do not include unemployed individuals who are not registered to İŞKUR or hidden unemployment figures in the agricultural sector. Nevertheless, as can be seen in the paragraphs below, these figures provide important information on rather limited labor market of the provinces in the CPA over the years. This data strongly reveals the number of available private and public sector jobs in the region.

**Table 6-41 Unemployed Population by Gender in CPA (2011 and 2020)**

Provinces	2011			2020		
	Female	Male	Total	Female	Male	Total
Yozgat	3,464	7,358	10,822	6,567	6,956	13,523
Tokat	3,773	7,367	11,140	10,355	11,729	22,084
Çorum	6,113	7,665	13,788	9,166	8,990	18,156
Sivas	5,543	11,729	17,272	13,909	14,811	28,720

Source: İŞKUR Annual Reports, 2011 and 2020

According to the 2019 Social Security Institution (SSI) data, the number of workplaces registered with the SGK in the CPA provinces are given in Table 6-42 below. The percentages

of workplaces registered with just one employee are 40% in Tokat; 38% in Yozgat; and 37% for both Çorum and Sivas. When the industrial employment in districts evaluated it can be seen that most people are employed in manufacturing, construction and wholesale; retail trade; and repair of motor vehicles and motorcycles.

**Table 6-42 Employment in Workplaces Registered to SSI in CPA**

Province	Number of workplaces registered with SGK	Workplaces where only one employee is registered		Total number of compulsory insured employees in work places	Number of active insured people in Agriculture (self employed/optional)	Proportion of people directly covered by social security in economically active population (Age 14 - 64)*
		Number	%			
Yozgat	6,017	2,293	38	40,207	10,443	13.22%
Tokat	8,873	3,549	40	58,316	7,129	15.35%
Çorum	8741	3206	37	55,756	5,613	17.64%
Sivas	10,015	3,682	37	72,591	11,261	17.91%

(\*) This does not include people who contribute to private pension funds although the proportion of this very low.  
Source: Adopted from SGK 2019 and TurkStat 2019

Table 6-42 above also indicates that only a small proportion of the people who are at economically active age are covered by social security.

When companies employ 20 people or more considered the average of women employees in Turkey is 29,1%. The percentage of women employed in similar workplaces in Tokat and Çorum are around the Turkish average which are 32,8% and 27% respectively. The employment of women in these workplaces is much lower in Sivas (19,5,%) and Yozgat (18,4%) Provinces. In the provinces mentioned here, the rate of women working in part-time jobs is well above that of men. The rate of male employees in Yozgat is approximately 8 times higher than that of women. While the rate of male employees is 88.6%, the rate of female employees is 11.4%. When the gender distribution by sectors is analyzed, some striking data stand out. Accordingly, while there are no female employees in some sectors, there are almost no female employees in others. For example, while there is no female employee in the real estate activities and culture, arts and entertainment sector, construction, water supply; the rate of female employees in the sewage, waste management and mining and quarrying sectors is around 1%. The only sector where the proportion of women is higher than men is seen as human health and social work activities. The rate of women in this sector is 52.4%, while the rate of men is 47.6%. (Yozgat Durum Analizi, 2019: 93-4). When the sectoral status of unpaid family workers in Yozgat examined they are overwhelmingly employed in the agricultural sector (89%). This ratio is above the Turkish average of 85% (2019: 98). In the distribution of unpaid family workers in terms of gender, it is seen that 33.0% of the employees are men and 66.9% are women. Overall in the province 43% of women workers unpaid family worker, percentage of women working for an employee or in self-employment is only around 10%. It is expected that the disintegration in the agricultural sector, which triggers the migration phenomenon with the shift from agriculture to services and industry, will increase in the next 10 years, and additional measures should be taken in the region for the employment of women and for the members of other disadvantaged groups.

According to Yozgat Social Profile Survey (2016), 48.5% of the participants stated that they do not have regular jobs. The reasons for not working for participants who declare that they do not have a regular job; 28,5% stated that they were housewives, 24,2% emphasized that they were unable to find a job, 23,4% were students, 16,3% were retired and so on. The most important indicator that emerges from the data is the problem of unemployment or lack of job opportunities in Yozgat.

In Sivas Social Profile Research (2016) a similar proportion of people stated that they do not have regular jobs. Participant who did not have a regular work were asked the reasons and 31% stated that they were housewives, 25.5% said that they could not find a job despite looking for one, 18% were retired and 16.5% were students.

As part of CLQ muhtars of the CPA settlements were asked about the main source of income of people in their settlements. For almost 56% of people the main source of income was agricultural crop production, for almost 30% it was animal husbandry. Twelve percent of the muhtars emphasized that the main source of livelihood in their settlements was retirement pension. Wage labor other main sources of income reported by 3% of the muhtars (see Table 6-43).

**Table 6-43 Main Source of Livelihoods in CPA Settlements**

	Frequency (N)	Percent (%)
Agricultural crop production	98	55.7
Animal husbandry	52	29.5
Retirement pension	21	11.9
Wage labour (industry/construction)	2	1.1
Other	3	1.7

Source: Çekerek Field Study (CLQ), 2020

### **Socio-Economic Status**

In this study socio-economic level measured by using variables including demographics, employment, education, healthcare, industry, agriculture, construction, finances and other indicators of well-being. Using these indicators settlements were ranked from top to bottom as well as grouped in six different categories; first group having the highest well-being indicators and the sixth is the lowest. Apart from Yozgat Central District all the other districts in the CPA fell into the lower groups.

**Table 6-44 SES ranking of the CPA provinces amongst all provinces in Turkey (2010)**

District	Province	Level of development among 872 districts	Ranking in six different categories	Index of development
Akdağmadeni	Yozgat	614	4	-0.53296
Aydıncık	Yozgat	760	6	-0.81903
Çayıralan	Yozgat	492	4	-0.30647
Çekerek	Yozgat	758	6	-0.81328
Kadışehir	Yozgat	815	6	-1.10911
Merkez	Yozgat	144	2	0.71686
Saraykent	Yozgat	725	5	-0.73445
Sorgun	Yozgat	419	3	-0.7494
Artova	Tokat	733	5	-0.74848
Sulusaray	Tokat	775	6	-0.88329
Yeşilyurt	Tokat	659	5	-0.62058
Alaca	Çorum	485	4	-0.29234
Ortaköy	Çorum	686	5	-0.65301
Yıldızeli	Sivas	754	6	-0.80550

The current studies also highlight the lower SES in the CPA Provinces. ENDEKSA SES Index, which is developed by a private firm, ranks the population according to various variables including, income, leisure time activities, ownership of various assets commodities and so on. These states are ranked from A +, which is the highest, to D, the lowest, and categories are A +; A; B; C and D. The advantage using this index is that gives an up-to-date SES of the Districts in the CPA. Here the population Socio-Economic Status (SES) Index was created by ranking according to various variables, including income, leisure activities, ownership of various assets, and so on. Population rates in all groups are given in the Table 6-45 below for all the districts of the CPA. According to 2019 data an overwhelming proportion of the people in the provinces of the CPA were located at the lowest groups of C and D (See Table 6-45 for further details).

**Table 6-45 Population Rate in CPA by Socio-Economic Status Groups (2019)**

District	Province	Group A+	Group A	Group B	Group C	Group D
Akdağmadeni	Yozgat	91 (0.21%)	1,264 (2.97%)	3,824 (8.97%)	10,553 (24.76%)	26,889 (63.09%)
Aydincık	Yozgat	0	250 (2.48%)	860 (8.53%)	2,222 (22.05%)	6,747 (66.94%)
Çayıralan	Yozgat	10 (0.08%)	326 (2.59%)	985 (21.73%)	2,730 (21.73%)	8,512 (67.75%)
Çekerek	Yozgat	46 (0.24%)	502 (2.58%)	1,588 (8.00%)	4,182 (21.42%)	13,179 (67.70%)
Kadıışehri	Yozgat	17 (0.15%)	317 (2.81%)	1,022 (9.06%)	2,711 (24.04%)	..210 (63.94%)
Merkez	Yozgat	4,475 (1.06%)	17,362 (4.17%)	47,490 (11.27%)	121,109 (28.75%)	44,317 (41.70%)
Saraykent	Yozgat	0	316 (2.53%)	1,156 (9.26%)	2,786 (22.31%)	8,228 (65.90%)
Sorgun	Yozgat	492 (0.54%)	3,083 (3.88%)	.275 (11.66%)	25,550 (32.13%)	41,195 (51.79%)
Artova	Tokat	0	140 (1.67%)	584 (6.97%)	1,295 (15.46%)	6,355 (79.89%)
Sulusaray	Tokat	0	144 (1.90%)	704 (9.27%)	1,747 (19.45%)	5,272 (69.39%)
Yeşilyurt	Tokat	0	123 (1.37%)	797 (8.89%)	1,540 (17.17%)	6,509 (72.57%)
Alaca	Corum	0	892 (2.87%)	2,679 (8.61%)	7,473 (24.01%)	20,077 (64.51%)
Ortaköy	Corum	0	181 (2.56%)	621 (8.78%)	1,615 (22.85%)	4,652 (65.81%)
Yıldızeli	Sivas	81 (0.25%)	411 (1.25%)	1,263 (3.85%)	27,818 (84.82%)	27,817 (84.82%)

Source: adopted from <https://www.endeksa.com/tr>

The Socio-Economic Development Ranking Survey of the Ministry of Industry and Technology, Provinces and Regions 2017 (SEGE, 2017) ranks the provinces according to variables such

as demography, employment, education, health, competitive and innovative capacity, financial, accessibility and quality of life. This ranking ranks the provinces (81 in total) between 1 (highest) and 6 (lowest) based on the average score the province had received. As can be seen from the Table 6-46 below, the provinces in the basin are very low in the province ranking. While provinces of the CPA are in the 4th and 5th tiers, the average scores of all provinces are negative. For example, the average score of Istanbul in the first tier is 4,051. Again at the same tier, Ankara's score is 2,718 and the score of Izmir is 1,926 (SEGE 2017: 35). Average scores of provinces in the CPA were: Çorum, -0.262; Sivas, -0.137; Tokat, -0.381; and Yozgat, -0.589 (See Table 6-45).

**Table 6-46 Socio-Economic Development ranking of the provinces in the CPA (2017)**

Provinces	Ranking according to 81 Provinces	Tier	Score
Çorum	50	4	-0.262
Sivas	45	4	-0.137
Tokat	56	5	-0.381
Yozgat	63	5	-0.589

Source: SEGE, 2017

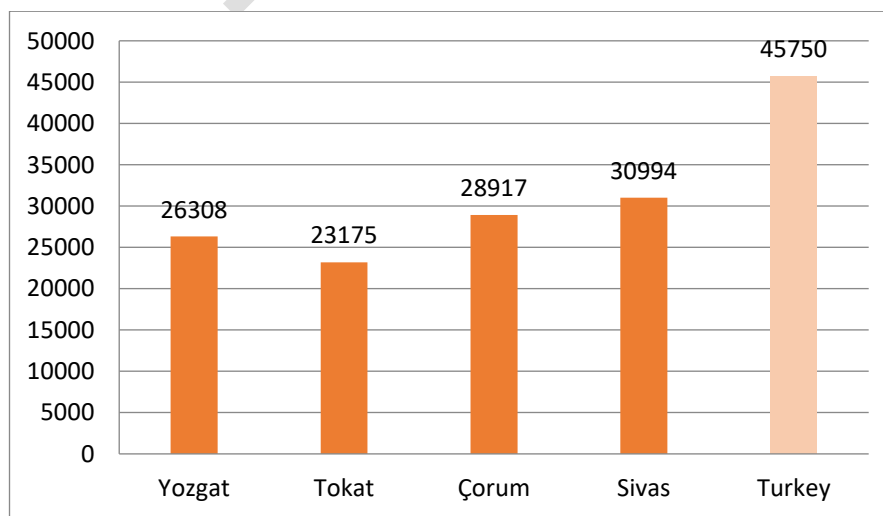
TurkStat 2019 data provides a comparative information about the income per capita, Gross Domestic Product (GDP) in USD at province level and ranks them accordingly. Table 6-47 below gives information about the GDP income per capita for the provinces in the CPA and their ranking among 81 provinces in Turkey.

**Table 6-47 Income per Capita, Gross Domestic Product in USD (2017 and 2018)**

Province	Ranking out of 81 Provinces	Income per capita in 2017 (USD)	Income per capita in 2018 (USD)	Change (%)
Çorum	50	6,800	6,126	-9,91
Sivas	58	7,365	6,566	-10,85
Yozgat	59	6,254	5,574	-10,88
Tokat	63	5,522	4,910	-11,09
Turkey	-	10,616	9,693	-8,70

Source: TurkStat

Figure 6-28 below provides GDP in Turkish Lira per capita for 2018 and as can be seen from the Figure the income per capita is much lower in the provinces of the CPA compared to average of Turkey.



**Figure 6-28 Income per capita, Gross Domestic Product in TL (2018)**

Social studies on the provinces of the CPA also present similar findings on socio-economic status of the people. For example, the results of the Yozgat Social Profile Survey (ORAN,

2016) show that 13% of the people had no regular income and 33% were in the low income category. The finding of the study show that a significant portion of the population is living below the poverty line. Yavuzkanat's work also supports this phenomenon. According to the study findings Yozgat was among the first 20 provinces with a high risk of poverty in Turkey (Yavuzkanat, 2013).

### 6.2.3. Agricultural Production in CPA

#### *Agricultural Production in CPA*

Agriculture has traditionally been the most important sector in all provinces in the Project Area. Animal husbandry has been combined with vegetative farming activities throughout the basin. In order to make an accurate assessment of agricultural activities the following steps have been taken:

3. Overview of current situation with district-based statistics of agricultural data,
4. Overview of the time change in agricultural production to understand trends/tendencies,
5. Overview of current situation with village-based data to identify key issues

In order to make these assessments a series of statistical and registry information have been used. Statistical information is derived from tables annually developed by the MoAF and shared with TurkStat. These data are long years inventory data compiled on district basis. As for the registry information database called Farmer Registration System (ÇKS) has been used. It should be noted that some of the arable areas are not registered in the ÇKS for various reasons such as small parcels, not being transferred to inheritors, and very low support for some crops. According to feedback from HHQ, 39.7% of farmers in the Project Area are not registered yet in ÇKS (Table 6-48). This calls for possible divergence of ÇKS data from statistical values of TurkStat.

**Table 6-48 Are you registered in any agricultural system?**

Answers	Frequency	Valid Percent
YES	152	60.3
NO	100	39.7
<b>TOTAL</b>	<b>252</b>	<b>100</b>

Source: Household Survey, Çekerek Project Area, 2020

#### *Total Arable Land*

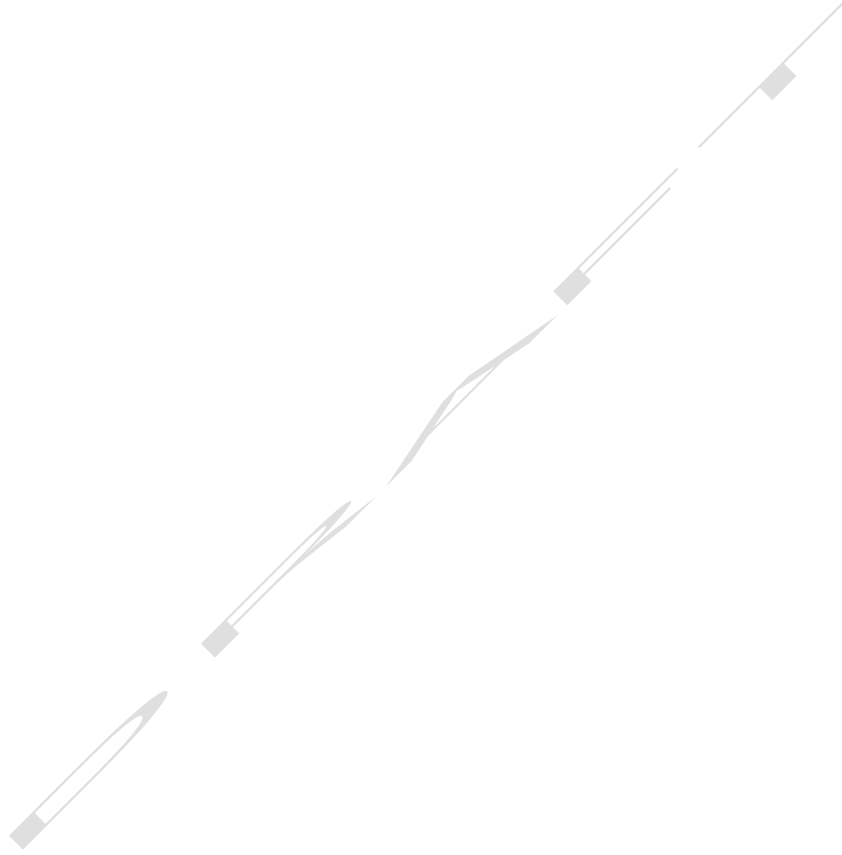
According to the TurkStat 2019 data, total agricultural land in the CPA districts is 536,934 hectares. Yeşilyurt district of Tokat has the smallest agricultural land size in the Project area with 9 hectares and the largest land size is in Yıldızeli, Sivas with 105,000 hectares. Since 2015, it is seen that the agricultural areas have decreased by 21.5 hectares which is 4% of the total arable land. The sharpest examples of this decline were noticed in Alaca, Çorum; Yıldızeli, Sivas and Sorgun, Yozgat.

**Table 6-49 Total Agricultural Area in Çekerek Project Area by Districts (2015-2019)**

Provinces of CPA	Districts of CPA	Agricultural Area (decares)		
		2015	2019	V*
Provinces	Districts			
Yozgat	Akdağmadeni	388,003	379,426	-8,577
Yozgat	Aydıncık	126,561	89,431	-37,130
Yozgat	Çayıralan	202,369	188,925	-13,444
Yozgat	Çekerek	162,521	146,359	-16,162
Yozgat	Kadışehri	134,400	154,990	20,590

Yozgat	Merkez	852,388	870,813	18,425
Yozgat	Saraykent	107,385	86,384	-21,001
Yozgat	Sorgun	837,275	929,715	92,440
Tokat	Artova	112,698	108,074	-4,624
Tokat	Sulusaray	100,111	100,433	322
Tokat	Yeşilyurt	95,605	91,855	-3,750
Çorum	Alaca	972,479	830,501	-141,978
Çorum	Ortaköy	125,641	126,728	1,087
Sivas	Yıldızeli	1,151,904	1,049,788	-102,116
<b>TOTAL</b>		<b>5,369,340</b>	<b>5,153,422</b>	<b>-215,918</b>

Source: TurkStat (V\*:Variation)



Pasture Assets

Village-based condition and status of pasturelands are given in Annex 3<sup>26</sup> which shows characteristics of the pasture lands within the boundaries of CPA in detail. In order to give a broad picture, district-level data is given below in Table 6-50. According to the table, total pastureland in the Project Area is about 75,000 ha. Yıldızeli, Sivas has the highest amount of pasture land which is more than half of the total. It is followed by Sorgun, Yozgat (about 18,000) and Aydıncık, Yozgat (about 39,000). Majority of the pasture land assets are classified as “poor” with very limited grazing capacities.

**Table 6-50 Pasture Assets in CPA by Districts**

Provinces	Districts	Pasture Land (Decares)	
		2020	Class
Yozgat	Akdağmadeni	6,471.45	Poor
Yozgat	Aydıncık	39,367.75	Poor
Yozgat	Çayıralan	35,489.71	Poor
Yozgat	Çekerek	28,966.78	Poor
Yozgat	Kadışehri	26,972.59	Poor
Yozgat	Merkez	38,442.03	Poor
Yozgat	Saraykent	6,409.09	Poor
Yozgat	Sorgun	182,247.24	Poor
Tokat	Artova	2,944.65	Poor - Medium
Tokat	Sulusaray	888,55	Poor-Medium
Tokat	Yeşilyurt	350,70	Poor-Medium
Çorum	Alaca	9,505.94	Poor
Çorum	Ortaköy	1,858.98	Poor-Medium
Sivas	Yıldızeli	373,341.10	Poor
<b>TOTAL</b>		<b>753,256.56</b>	

Source: MoAF, 2020

Based on the observations and discussions carried out during the initial site visit (22-25 September 2020), interviews with muhtars and local communities and literature review, pasture areas in the basin are generally formed on sloping lands with thin soil structure. The precipitation regime in the region is rainy in winter and generally dry in summer. Therefore, grass yield of pastures is low due to weak soil, high slopes and semi-arid climate zone. Despite such disadvantages that limit grazing capacity, livestock husbandry is very common in the region. Grass yield of pastures in the Project area is very low in seasons other than spring. For this reason, pastures in the region are mostly used for walking and only in spring for limited grazing purpose.

<sup>26</sup> It was prepared according to application norms related to pasture grazing status and classes defined in the Article 6 of Pasture Regulation (Official Journal dated 31/7/1998 and Issue: 23419) set on the basis of Article 31 of Pasture Law No. 4342.

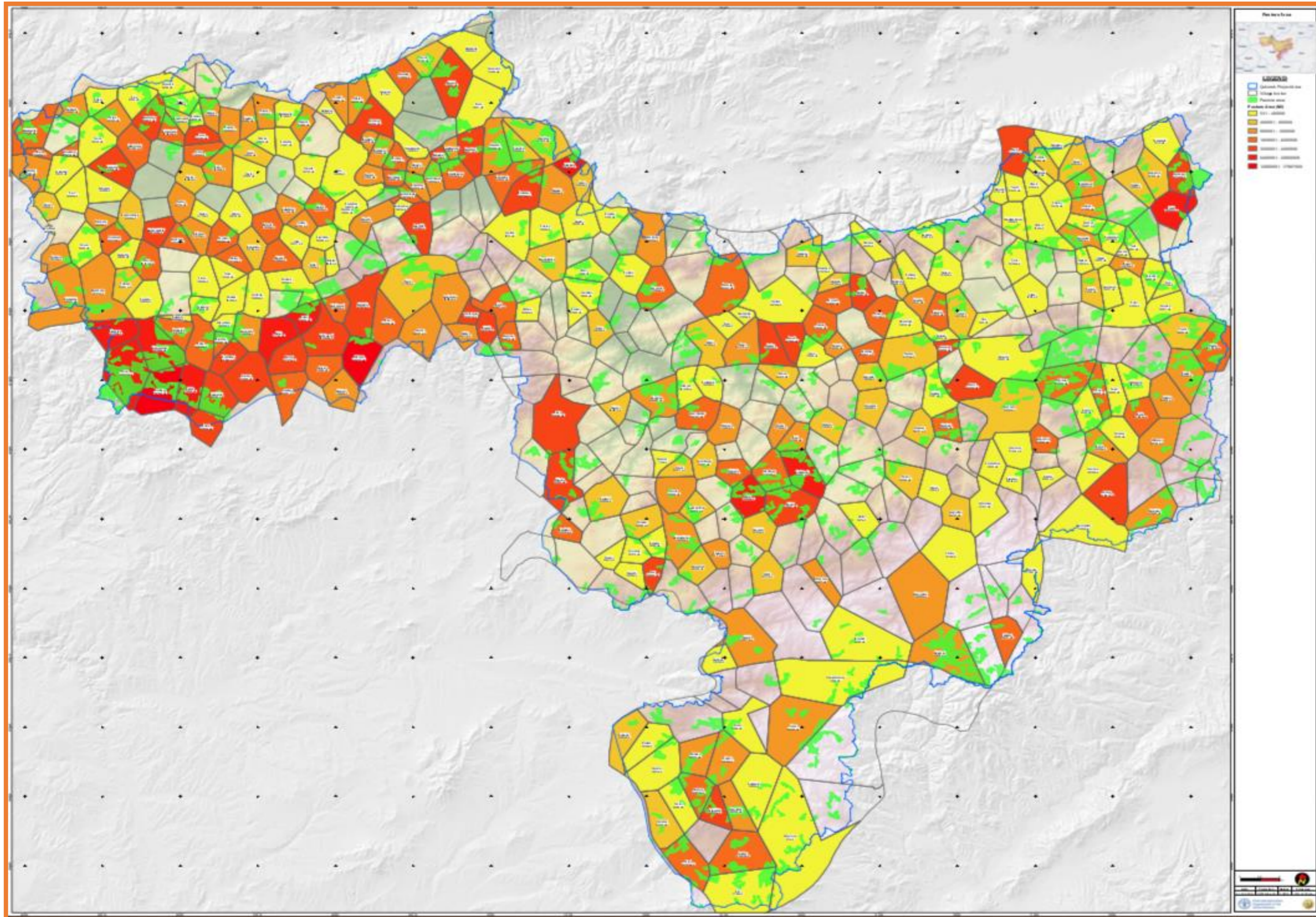


Figure 6-29 Pasture Map [Access Link](#)

Locations of pasturelands are shown in Figure 6-29 . Status and classes of pasture lands in the Project Area are given in Annex 3. This information will be guiding for the related sub-projects in terms of their locations.

### **Vegetative Production and Livestock Assets**

Law No. 6537 on Soil Conservation and Land Use (issued as an amendment of the Law No. 5043) provides ranges of agricultural land size with adequate income, as listed in Table 6-51 Agricultural Land in CPA for the Project Area.

**Table 6-51 Agricultural Land in CPA**

Provinces	Districts	Irrigated (da)	Dry (da)	Garden (da)	Greenhouse (da)
Yozgat	Akdağmadeni	90	155	10	3
Yozgat	Aydıncık	90	175	10	3
Yozgat	Çayıralan	95	170	10	3
Yozgat	Çekerek	75	155	10	3
Yozgat	Kadışehir	90	175	10	3
Yozgat	Merkez	75	150	10	3
Yozgat	Saraykent	75	150	10	3
Yozgat	Sorgun	70	130	10	3
Tokat	Artova	85	200	10	3
Tokat	Sulusaray	95	165	10	3
Tokat	Yeşilyurt	95	150	10	3
Çorum	Alaca	80	150	10	3
Çorum	Ortaköy	100	200	10	3
Sivas	Yıldızeli	75	140	10	3
<b>Min-Max Values</b>		<b>75-90</b>	<b>130-200</b>	<b>10</b>	<b>3</b>

Source: Law No. 6537 on Soil Conservation and Land Use (issued as an amendment of the Law No. 5043)

The above information from the Law no: 6357 is supported with the use of Household Survey feedbacks regarding land ownership conditions and models in the Project Area. Based on the Household Survey, percentage of households who own their lands is 82.50% (Table 6-52).

**Table 6-52 Do you have your own agricultural lands?**

Answers	Frequency	Valid Percent
YES	217	82.50
NO	46	17.50
TOTAL	263	100.00

Source: Household Survey, Çekerek Project Area, 2020

As Table 6-53 derived from the Household Survey shows, less than 15% of the households have arable land over 80 decares. Considering the adequate agricultural land size given in the figure Table 6-54, it is perceived that majority of the households have inadequate arable land size.

**Table 6-53 What is the size of arable land under your ownership?**

Decares	Frequency	Valid Percent	Cumulative Percent
1-20	68	32.90	32.90

21-40	59	28.60	61.40
41-60	28	13.70	74.90
61-80	23	11.20	86.00
81-100	12	5.80	91.80
100+	17	8.30	100.00
<b>TOTAL</b>	<b>207</b>	<b>100.00</b>	<b>100.00</b>

Source: Household Survey, Çekerek Project Area, 2020

Moreover, fragmentation of arable land in the Project Area was questioned with separated parcels in Table 6-54. 60.50% of the landowners have more than 4 separate parcels and 21.00% of land separated more than eight different pieces. Considering the land size and number of separate parcels, this is an obvious indicator showing arable land in CPA are small and fragmented.

**Table 6-54 How many separate parcels does your arable land consist of?**

Number of Parcels	Frequency	Valid Percent	Cumulative Percent
1-2	42	21.00	21.00
3-4	37	18.50	39.50
5-6	43	21.50	61.00
7-8	36	18.00	79.00
9-10	13	6.50	85.50
10+	29	14.50	100.00
<b>TOTAL</b>	<b>200</b>	<b>100.00</b>	<b>100.00</b>

Source: Household Survey, Çekerek Project Area, 2020

In accordance with previous questions, adequacy of land size appears inadequate by approximately 75% of the households (Table 6-55). In this percentage, more than 20% of the household answered the question as very inadequate. There is no doubt that land size and fragmentation problem triggers high inadequacy rate in CPA.

**Table 6-55 Do you think the land you use is adequate?**

Answers	Frequency	Valid Percent
Very adequate	2	0.80
Adequate	60	25.10
Inadequate	127	53.10
Very inadequate	50	20.90
<b>TOTAL</b>	<b>239</b>	<b>100.00</b>

Source: Household Survey, Çekerek Project Area, 2020

On the other hand, Household Survey questioned frequency of agricultural activities on someone else's land (including renting, crop sharing, using without rent payment, etc.) in CPA. It was seen that the proportion of those engaged in agricultural activities other than their own arable land is 32.80 percentage (See Table 6-56).

**Table 6-56 Are there any agricultural activities on someone else's land?**

Answers	Frequency	Valid Percent
YES	87	32.80

NO	178	67.20
TOTAL	265	100.00

Source: Household Survey, Çekerek Project Area, 2020

It was shown that nearly one-third of farmers cultivating others' land. More than half of these farmers doing agricultural activities on the lands belong to family member or close relative in the village (54.1%) and outside the village (18.9%) (See Table 6-57).

**Table 6-57 Who owns this land ?**

Answers	Frequency	Valid Percent (%)
Family member or close relative living in the village	40	54.1
Family member and close relative living outside the village	14	18.9
Villagers	10	13.5
Non-resident village member	8	10.8
Others	2	2.8
TOTAL	74	100.00

Source: Household Survey, Çekerek Project Area, 2020

### ***Vegetative Production***

Village-based agricultural crop production pattern of CPA was demonstrated in Figure 6-30. As mentioned in the methodology section, up to ninety percentages of arable land assets scoped in while processing the data. Every villages located in the Project Area was analysed to make accurate identification and assessment for further stage of the SESA Report. The products were categorized and coloured in this map. The map of crop production pattern will be articulated on statistics given in below sub-headings.

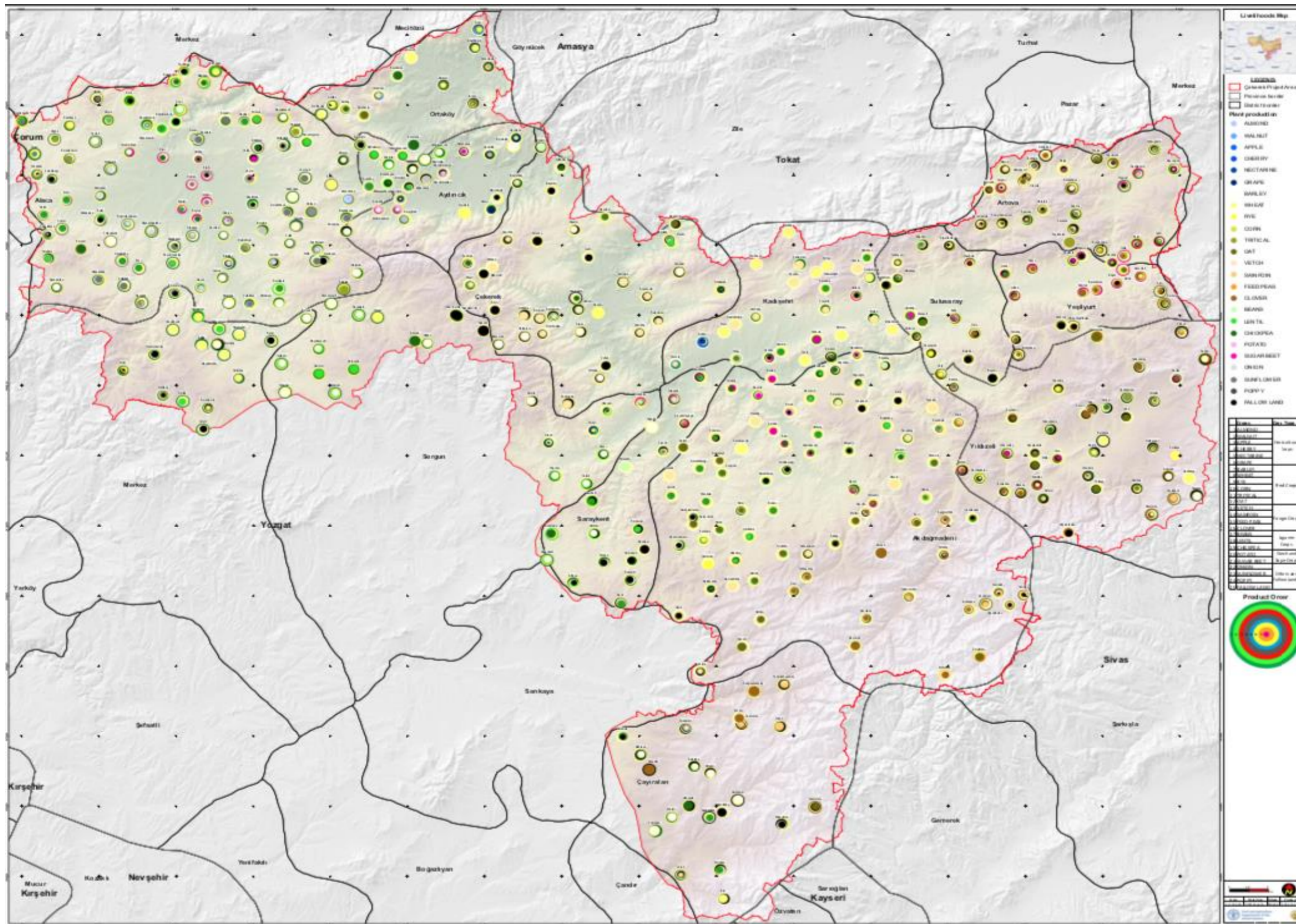


Figure 6-30 Village-based agricultural crop production pattern of CPA [Access Link](#)

Source: MoAF (Analysis and map prepared by FAO-SESA Team)

## Cereal Production

Cereal based farming is a dominant agricultural activity for the rural population living in the CPA. Based on the information given in Table 6-58, more than 2.5 million decares of agricultural area in the basin covered with wheat, barley and among other cereals. However, there has been a decrease of 11.5% in the cereals production areas since 2015. Looking at the details of this percentages given total wheat production decreased by 14.72%, total barley production increased by 7% and the other cereals increased by 5.88% in the project area from 2015 to 2019. Considering Table 6-58, it is concluded that the main reason for the decline in the production of cereal crops is the decrease in wheat production in the CPA.

**Table 6-58 Vegetative Production in CPA by Districts (2015-2019)**

Province	Districts	Wheat Production Area (Decares)			Barley Production Area (Decares)			Other Cereals Production Area (Decares)		
		2015	2019	V*	2015	2019	V*	2015	2019	V*
Yozgat	Akdağmadeni	213,544	201,009	-12,535	34,856	34,092	-764	1,837	1,771	-66
Yozgat	Aydıncık	54,083	35,990	-18,093	4,254	7,232	2,978	49	43	-6
Yozgat	Çayıralan	121,496	95,500	-25,996	8,413	8,303	-110	0	405	405
Yozgat	Çekerek	113,253	98,453	-14,800	5,253	9,196	3,943	37	68	31
Yozgat	Kadıışehri	90,971	93,452	2,481	3,291	7,115	3,824	49	43	-6
Yozgat	Merkez	434,764	325,746	-109,018	50,292	89,806	39,514	1,034	493	-541
Yozgat	Saraykent	76,114	57,615	-18,499	1,350	790	-560	1,046	3,026	1,980
Yozgat	Sorgun	435,243	359,351	-75,892	30,486	37,383	6,897	438	384	-54
Tokat	Artova	51,637	39,651	-11,986	7,450	13,194	5,744	15	3,281	3,266
Tokat	Sulusaray	44,342	41,400	-2,942	20,971	13,825	-7,146	350	372	22
Tokat	Yeşilyurt	25,644	13,856	-11,788	20,487	20,211	-276	7,568	3,765	-3,803
Çorum	Alaca	402,420	33,9150	-63,270	94,517	65,196	-29,321	139	9,103	8,964
Çorum	Ortaköy	51,780	74,481	22,701	24,105	15,875	-8,230	327	3,194	2,867
Sivas	Yıldızeli	410,051	378,050	-32,001	85,470	96,375	10,905	34,668	24,406	-10,262
<b>TOTAL</b>		<b>2,525,342</b>	<b>2,153,704</b>	<b>-371,638</b>	<b>391,195</b>	<b>418,593</b>	<b>27,398</b>	<b>47,557</b>	<b>50,354</b>	<b>2,797</b>

Source: TurkStat (V\*:Variation)

Despite the overall decline in total, cereal production has still sustained its percentage dominance with 50.89 in total agricultural areas of the region. Table 6-59 is also demonstrated that this rate exceeds 70% in some districts such as Ortaköy, Çekerek and Saraykent.

**Table 6-59 Cereal Production in 2019 by Districts of CPA**

Provinces	Districts	Total Agricultural Area (Decares)	Total Cereals Production area (Decares)	Percentage of Cereals Production Area (Decares)
Yozgat	Akdağmadeni	379,426	236,872	62.43
Yozgat	Aydıncık	89,431	43,265	48.38
Yozgat	Çayıralan	188,925	104,208	55.16
Yozgat	Çekerek	146,359	107,717	73.6
Yozgat	Kadıışehri	154,990	100,610	64.91
Yozgat	Merkez	870,813	416,045	47.78
Yozgat	Saraykent	86,384	61,431	71.11
Yozgat	Sorgun	929,715	397,118	42.71
Tokat	Artova	108,074	56,126	51.93
Tokat	Sulusaray	100,433	55,597	55.36

Tokat	Yeşilyurt	91,855	37,832	41.19
Çorum	Alaca	830,501	413,449	49.78
Çorum	Ortaköy	126,728	93,550	73.82
Sivas	Yıldızeli	1,049,788	498,831	47.52
<b>TOTAL</b>		<b>5,153,422</b>	<b>2,622,651</b>	<b>50.89</b>

Source: TurkStat

It can be clearly deduced from these rates that the climate of the region obliges the cultivation of cereals. Especially in the non-irrigated areas, there are not many products having commercial value other than cereals. On the other hand, it is known that the rate of grain cultivation has decreased proportionally in irrigated agricultural areas. In addition, it was also observed in the interviews made during the site visit (22-25 September 2020) that farmer tendencies have been changing in this direction as well. The main reason for this is the increasing number of high-income alternative crops such as vegetables, fruits and forage crops, thus increasing tendencies of farmers to change crop pattern in irrigated lands at the same time.

### Legume Production

The statistics given below Table 6-60 point out that the total legume production in the districts of the Çekerek Project Area covers only 1.1% of the total arable land. Chickpea has the highest production area (506,864 decares) followed by lentil (97,609 decares) and bean (3,880 decares) production in 2019. Considering the amount of change by years, it was perceived that the chickpea and lentil production areas in the region increased more than twice compared to 2015. Districts such as Merkez and Sorgun districts of Yozgat and Alaca district of Çorum stand out compare to other districts in terms of legume production.

**Table 6-60 Legume Production in CPA by Districts (2015-2019)**

Province	Districts	Chickpea Production (Decares)			Lentil Production (Decares)			Bean Production (Decares)		
		2015	2019	V*	2015	2019	V*	2015	2019	V*
Yozgat	Akdağmadeni	2,200	1,511	-689	150	1,000	850	380	335	-45
Yozgat	Aydıncık	4,900	8,357	3,457	1,400	2,924	1,524	150	150	0
Yozgat	Çayıralan	3,100	11,760	8,660	0	1,205	1,205	0	35	35
Yozgat	Çekerek	1,500	3,924	2,424	225	417	192	125	270	145
Yozgat	Kadıışehri	100	2,616	2,516	30	67	37	120	60	-60
Yozgat	Merkez	70,650	194,302	123,652	640	5,900	5,260	1,500	1,000	-500
Yozgat	Saraykent	1,985	2,523	538	850	1,703	853	50	100	50
Yozgat	Sorgun	70,100	154,352	84,252	20,050	70,500	50,450	1,500	1,000	-500
Tokat	Artova	1,800	9,119	7,319	43	130	87	0	0	0
Tokat	Sulusaray	500	1,598	1,098	25	20	-5	50	50	0
Tokat	Yeşilyurt	160	1,176	1,016	120	150	30	100	195	95
Çorum	Alaca	39,950	103,849	63,899	15,200	13,000	-2,200	380	205	-175
Çorum	Ortaköy	6,200	8,412	2,212	250	500	250	140	230	90
Sivas	Yıldızeli	1,050	3,365	2,315	150	93	-57	450	250	-200
<b>TOTAL</b>		<b>204,195</b>	<b>506,864</b>	<b>302,669</b>	<b>39,133</b>	<b>97,609</b>	<b>58,476</b>	<b>4,945</b>	<b>3,880</b>	<b>-1,065</b>

Source: TurkStat (V\*:Variation)

### Forage Crop Production

Livestock husbandry is known as a common economic activity in Çekerek Project Area. It is also known that the most costly input of livestock husbandry is feeding expenditures. The only way to naturally reduce these costs is animal feeding through pasture grazing. On the contrary, it was observed during the field visits that the pasture assets in the region has weak grass

structure and not enough capacity to feed livestock assets in the Project Area. For this reason, forage crop farming has an additional importance for the sustainability of animal husbandry in the region. Considering the data given in Table 6-61, it is extracted that alfalfa, vetch and sainfoin cultivation are more preferred than other forage plants in the region. However, when the amount of change by years is examined, it is seen that the cultivation areas of these three products have decreased 140,853 decares in total, and the cultivation areas of other forage plants have increased 90,520 decares. This may indicate that a planting habit of forage crops has not yet been formed in the region among farmers.

**Table 6-61 Forage Crop Production in CPA by Districts (2015-2019)**

Province	Districts	Alfalfa Production (Decares)			Vetch Production (Decares)			Sainfoin Production (Decares)			Other Forage Crops (Decares)		
		2015	2019	V*	2015	2019	V*	2015	2019	V*	2015	2019	V*
Yozgat	Akdağmadeni	3,000	4,000	1,000	35,750	33,900	-1,850	4,500	3,500	-1,000	300	600	300
Yozgat	Aydıncık	390	450	60	1,000	1,100	100	60	50	-10	400	150	-250
Yozgat	Çayıralan	1,356	1,870	514	2,200	2,285	85	650	907	257	248	123	-125
Yozgat	Çekerek	380	842	462	4,750	9,515	4,765	280	340	60	450	110	-340
Yozgat	Kadıışehri	800	800	0	1,500	2,550	1,050	80	65	-15	50	644	594
Yozgat	Merkez	10,743	8,000	-2,743	37,000	34,500	-2,500	6,639	4,000	-2,639	1,000	800	-200
Yozgat	Saraykent	223	300	77	5,250	4,300	-950	350	180	-170	50	140	90
Yozgat	Sorgun	2,000	2,000	0	4,500	4,500	0	500	500	0	300	462	162
Tokat	Artova	9,320	9,595	275	7,907	6,880	-1,027	2,604	765	-1,839	268	8,625	8,357
Tokat	Sulusaray	4,000	2,600	-1,400	7,050	3,700	-3,350	500	220	-280	130	13,680	13,550
Tokat	Yeşilyurt	6,430	7,800	1,370	3,830	3,150	-680	1,620	770	-850	7,385	16,550	9,165
Çorum	Alaca	1,015	1,360	345	5,251	3,241	-2,010	100	40	-60	541	2,518	1,977
Çorum	Ortaköy	280	800	520	4,170	5,450	1,280	10	150	140	140	4,030	3,890
Sivas	Yıldızeli	140,000	60,000	-80,000	7,850	3,000	-4,850	70,000	25,000	-45,000	2,300	55,650	53,350
<b>TOTAL</b>		<b>179,937</b>	<b>100,417</b>	<b>-79,520</b>	<b>128,008</b>	<b>118,071</b>	<b>-9,937</b>	<b>87,893</b>	<b>36,487</b>	<b>-51,406</b>	<b>13,562</b>	<b>104,082</b>	<b>90,520</b>

Source: TurkStat (V\*:Variation)

Moreover, considering the distribution of forage crop production areas by districts given in Table 6-62, it was seen that Yıldızeli district has 40% of the total forage crop production area. It has been revealed that only Akdağmadeni and Merkez districts of Yozgat could reach 10% in terms of forage production area except Yıldızeli in 2019. Considering the strong relationship between forage crops and livestock activities, it was deemed appropriate to identify areas where forage crop farming and animal husbandry activities are concentrated. Therefore, maps consisted of village-based livestock husbandry and crop pattern including forage crops were provided in Figure 6-30 in order to identify condition of the villages.

**Table 6-62 Forage Crops Production Distribution in CPA by Districts**

Provinces	Districts	Total Forage Crops Production (Decares)	Distribution of Production by Districts(%)
Yozgat	Akdağmadeni	42,000	11.7
Yozgat	Aydıncık	1,750	0.5
Yozgat	Çayıralan	5,185	1.4
Yozgat	Çekerek	10,807	3.0

Yozgat	Kadı̇ehri	4,059	1.1
Yozgat	Merkez	47,300	13.2
Yozgat	Saraykent	4,920	1.4
Yozgat	Sorgun	7,462	2.1
Tokat	Artova	25,865	7.2
Tokat	Sulusaray	20,200	5.6
Tokat	Yeşilyurt	28,270	7.9
Çorum	Alaca	7,159	2.0
Çorum	Ortaköy	10,430	2.9
Sivas	Yıldızeli	143,650	40.0
<b>TOTAL</b>		<b>359,057</b>	<b>100.0</b>

Source: TurkStat

### Fruit Production

The statistics show that the total fruit gardens in the districts of the Çekerek Project Area covers less than 1% of the total arable land. Table 6-63 also demonstrates that total fruit production has sharply decreased approximately 30% in years between 2015 and 2019. The sharpest example of this decline was seen in Sorgun district of Yozgat with 13,790 decares in the region. Nevertheless, when the total fruit planting area is compared with the amount of change in this area, it was stated that the change in fruit gardens from 2015 to 2019 is high in almost all districts. According to the site visit observations, the impression was that the fruit production in the region is not clustered, the production-market relationship is not formed enough, the region does not have attractive marketing conditions that will attract the attention of chain markets. On the other hand, it does not seem correct to make a definite inference about whether adequate income is obtained from the fruit growing activity in the project area without having information about the scales of the agro-enterprises.

**For instance; it was also observed during the field visits that a large scale orchard of 5,640 decares was established by combining 1,800 parcels within the scope of the “Deveci Basin Fruit Growing Integration Project” in cooperation with the state, citizens and private sector in Kabalı village of Kadı̇ehri district.**

Essential locations of gardens are examined in the map of crop production pattern (Figure 6-30) to verify site visit observation. It is confirmed that fruit production in the region is not clustered.

**Table 6-63 District Based Fruit Production Land in CPA (2015-2019)**

Province	Districts	Various Types of Fruit Gardens (Decares)		
		2015	2019	V*
Yozgat	Akdağmadeni	1,402	1,629	227
Yozgat	Aydıncık	465	644	179
Yozgat	Çayıralan	139	1,119	980
Yozgat	Çekerek	9,095	4,478	-4,617
Yozgat	Kadı̇ehri	6,589	7,301	712
Yozgat	Merkez	12,194	10,809	-1,385
Yozgat	Saraykent	901	885	-16
Yozgat	Sorgun	24,111	10,321	-13,790
Tokat	Artova	526	553	27
Tokat	Sulusaray	257	257	0
Tokat	Yeşilyurt	1,090	1,244	154
Çorum	Alaca	9,092	6,702	-2,390

Çorum	Ortaköy	3,760	3,083	-677
Sivas	Yıldızeli	644	953	309
<b>TOTAL</b>		<b>70,265</b>	<b>49,978</b>	<b>-20,287</b>

Source: TurkStat (V\*:Variation)

### **Vegetable Production**

According to the information given in Table 6-64, there is less than 40,000 decares of agricultural area in the Project Area covered with vegetables production. The table obviously shows that, Alaca district of Çorum stands out with its vegetable production compared to other districts. Alaca has 19,857 decares of vegetable production area and more than half of the total vegetable cultivation areas.

**Table 6-64 District Based Vegetable Production Land in CPA (2015-2019)**

Province	Districts	Various Types of Vegetables Production Land (Decares)		
		2015	2019	V*
Yozgat	Akdağmadeni	750	1,064	314
Yozgat	Aydıncık	3,600	4,380	780
Yozgat	Çayralan	74	171	97
Yozgat	Çekerek	771	714	-57
Yozgat	Kadıışehri	655	556	-99
Yozgat	Merkez	4,687	7,190	2,503
Yozgat	Saraykent	780	628	-152
Yozgat	Sorgun	1,637	1,463	-174
Tokat	Artova	12	9	-3
Tokat	Sulusaray	40	30	-10
Tokat	Yeşilyurt	235	330	95
Çorum	Alaca	16,362	19,857	3,495
Çorum	Ortaköy	1,513	1,596	83
Sivas	Yıldızeli	226	94	-132
<b>TOTAL</b>		<b>31,342</b>	<b>38,082</b>	<b>6,740</b>

Source: TurkStat (V\*:Variation)

It is known that commercial application of vegetable production depends on the sufficient irrigation infrastructure established in the region. Field observations made in Alaca district showed that the amount of irrigable agricultural land in the district is much higher than the average irrigated land of the Çekerek Project Area. In the light of the information obtained at the meeting held with the Alaca Municipality, it was learned that approximately 75,000 decares of agricultural land were irrigating with a closed irrigation system from the Koçhisar Dam. It was also mentioned that before the irrigation projects, the amount of grain and legume production was more common in Alaca district, but with the opening of agricultural areas to irrigation, the agricultural product pattern in the region tended to change towards products that generate more income, and also stated that farmers had positive feedbacks and adaption to this transformation.

### **Livestock Husbandry**

As previously mentioned briefly in pasture lands and forage crops sections, livestock activity in Çekerek Project Area has a long history and is sustained as an indispensable part of the rural life of the region. In this part of the study, it is aimed to detail the livestock husbandry in Çekerek Project Area based on statistics and field observations. The statistics of districts in the Project Area showed that there were 267,894 cattle and buffalo assets in 2015 and this number increased to 287,351 in 2019. Yıldızeli has the highest number (47,269) of cattle

followed by; Akdağmadeni (35,281), Merkez (35,080) and Sorgun (33,558) districts of Yozgat in 2019 (see Table 6-65).

**Table 6-65 District Based Bovine Numbers in CPA (2015-2019)**

Provinces	Districts	Number of Bovine					
		Cattle			Buffalo		
		2015	2019	V*	2015	2019	V*
Yozgat	Akdağmadeni	37,023	35,281	-1,742	74	281	207
Yozgat	Aydıncık	9,030	7,665	-1,365	49	45	-4
Yozgat	Çayıralan	6,356	8,451	2,095	0	19	19
Yozgat	Çekerek	36,290	25,431	-10,859	67	242	175
Yozgat	Kadıışehri	18,787	17,226	-1,561	128	379	251
Yozgat	Merkez	31,023	35,080	4,057	217	365	148
Yozgat	Saraykent	6,495	9,856	3,361	12	35	23
Yozgat	Sorgun	27,380	33,558	6,178	95	396	301
Tokat	Artova	10,705	13,291	2,586	23	49	26
Tokat	Sulusaray	12,153	11,028	-1,125	25	12	-13
Tokat	Yeşilyurt	12,946	13,945	999	2	7	5
Çorum	Alaca	17,113	22,150	5,037	41	49	8
Çorum	Ortaköy	5,441	4,741	-700	110	89	-21
Sivas	Yıldızeli	36,142	47,269	11,127	167	411	244
<b>TOTAL</b>		<b>266,884</b>	<b>284,972</b>	<b>18,088</b>	<b>1,010</b>	<b>2,379</b>	<b>1,369</b>

Source: TurkStat (V\*:Variation)

In accordance with this information, it is questioned whether livestock husbandry changed or not in the last 10 years via HHQ. On the contrary of the TurkStat statistics, majority of the participants answered this question as “decreased” or “nothing changed” (Table 6-66).

**Table 6-66 Have there been any livestock changes in the last 10 years?**

Answers	Frequency	Valid Percent
Yes, it's increased	36	18.80
Nothing changed	77	40.10
Yes, it's decreased	79	41.10
<b>TOTAL</b>	<b>192</b>	<b>100.00</b>

Source: Household Survey, Çekerek Project Area, 2020

Sources of livestock feeding areas were also questioned via Household Survey. 63% of the participants answered that pasturelands of the villages were a main source of livestock feeding. It was followed by feeding in barns (28.60%) and private lands (6.90%).

**Table 6-67 What areas do you use for animal feeding activity?**

Answers	Frequency	Valid Percent
Pasturelands of thevillages	119	63.00
On our own land	10	5.30
On someone else's land	3	1.60
Barn	54	28.60

Other	3	1.60
<b>TOTAL</b>	<b>189</b>	<b>100.00</b>

Source: Household Survey, Çekerek Project Area, 2020

Considering the distribution of bovine assets by districts (Table 6-68), it was seen that Yıldızeli, Akdağmadeni, Merkez and Sorgun districts have more than 53% of the total bovine assets in CPA.

**Table 6-68 Distribution of Bovine Assets and Forage Crop Production in CPA Districts**

Provinces	Districts	Total Bovine Assets	Distribution of Bovine Assets by Districts	Distribution of Forage Crop Production by Districts (%)
Yozgat	Akdağmadeni	35,562	12,4%	11.7
Yozgat	Aydincik	7,710	2,7%	0.5
Yozgat	Çayıralan	8,470	2,9%	1.4
Yozgat	Çekerek	25,673	8,9%	3.0
Yozgat	Kadıışehri	17,605	6,1%	1.1
Yozgat	Merkez	35,445	12,3%	13.2
Yozgat	Saraykent	9,891	3,4%	1.4
Yozgat	Sorgun	33,954	11,8%	2.1
Tokat	Artova	13,340	4,6%	7.2
Tokat	Sulusaray	11,040	3,8%	5.6
Tokat	Yeşilyurt	13,952	4,9%	7.9
Çorum	Alaca	22,199	7,7%	2.0
Çorum	Ortaköy	4,830	1,7%	2.9
Sivas	Yıldızeli	47,680	16,6%	40.0
<b>TOTAL</b>		<b>287,351</b>	<b>100,0%</b>	<b>100.0</b>

Source: TurkStat (V\*:Variation)

It is also observed that the ratios of forage crops and bovine assets have a consistent distribution, except for Sorgun district. Moreover, total number of buffaloes in the Project Area has increased from 1,010 to 2,379 since 2015. It is noteworthy that the number of buffalo in the region increased more than twice. Locations of pasturelands and bovine assets are shown in Figure 6-31.



As Table 6-69 from the HHQ shows, more than half of the households have less than 10 bovine and about 84% of participants have less than 20 bovine. In parallel, average number of bovine per agro-enterprises is 16 according to 2019 data from ÇKS.

**Table 6-69 What is the number of bovine in your agro-business?**

Range	Frequency	Valid Percent	Cumulative Percent
1-5	46	27.60	27.60
6-10	50	30.00	57.60
11-20	45	27.00	84.60
21-30	13	7.80	92.40
31-40	6	3.60	96.00
50+	7	4.20	100.00
TOTAL	167	100.0	100,00

Source: Household Survey, Çekerek Project Area, 2020

As for the ovine husbandry, it is seen that there has been an increase of over 12% in both sheep and goat husbandry from 2015 to 2019. Despite this general increase, it was mentioned that ovine husbandry has decreased dramatically in some districts such as Akdağmadeni, Çekerek, Saraykent.

**Table 6-70 Number of Ovine Assets in the Districts of CPA**

Provinces	Districts	Number of Ovine					
		Sheep			Goat		
		2015	2019	V*	2015	2019	V*
Yozgat	Akdağmadeni	19,734	11,200	-8,534	13,105	12,210	-895
Yozgat	Aydıncık	5,114	3,300	-1,814	2,495	1,100	-1,395
Yozgat	Çayıralan	11,480	13,804	2,324	181	688	507
Yozgat	Çekerek	15,605	10,100	-5,505	7,820	7,136	-684
Yozgat	Kadıışehri	7,385	8,000	615	1,000	2,541	1,541
Yozgat	Merkez	35,960	36,000	40	3,148	3,550	402
Yozgat	Saraykent	6,600	2,420	-4,180	750	165	-585
Yozgat	Sorgun	27,740	30,000	2,260	1,060	2,180	1,120
Tokat	Artova	10,199	9,633	-566	359	817	458
Tokat	Sulusaray	6,000	5,705	-295	500	1,245	745
Tokat	Yeşilyurt	7,573	6,987	-586	715	516	-199
Çorum	Alaca	12,373	19,030	6,657	357	921	564
Çorum	Ortaköy	3,475	3,679	204	445	1,910	1,465
Sivas	Yıldızeli	32,500	69,859	37,359	2,800	4,020	1,220
TOTAL		201,738	229,717	27,979	34,735	38,999	4,264

Source: TurkStat (V\*:Variation)

Considering the animal husbandry in general, it was realized that similar districts were in the first place in terms of ovine assets as well as bovine husbandry. Yıldızeli was the first place with number (47,269) of sheep followed by Merkez (36,000), Sorgun (30,000) districts of

Yozgat and differently Alaca district (19,030) of Çorum in 2019. Besides, it was seen that Akdağmadeni was the center of goat husbandry with 12,210 goats.

**Table 6-71 Distribution of Ovine Assets vs. Forage Crop Production in CPA Districts**

Provinces	Districts	Total Ovine Assets	Distribution of Ovine Assets by Districts	Distribution of Forage Crop Production by Districts(%)
Yozgat	Akdağmadeni	23,410	8,7%	11.7
Yozgat	Aydincık	4,400	1,6%	0.5
Yozgat	Çayıralan	14,492	5,4%	1.4
Yozgat	Çekerek	17,236	6,4%	3.0
Yozgat	Kadışehri	10,541	3,9%	1.1
Yozgat	Merkez	39,550	14,7%	13.2
Yozgat	Saraykent	2,585	1,0%	1.4
Yozgat	Sorgun	32,180	12,0%	2.1
Tokat	Artova	10,450	3,9%	7.2
Tokat	Sulusaray	6,950	2,6%	5.6
Tokat	Yeşilyurt	7,503	2,8%	7.9
Çorum	Alaca	19,951	7,4%	2.0
Çorum	Ortaköy	5,589	2,1%	2.9
Sivas	Yıldızeli	73,879	27,5%	40.0
<b>TOTAL</b>		<b>268,716</b>	<b>100,0%</b>	<b>100.0</b>

Source: TurkStat, 2019

In addition, it is also important to consider pasture land assets and livestock husbandry in the region together. As mentioned in the section on pastureland; grass yield of pastures of the Project area is very low in seasons other than spring. Therefore, pastures in the region are mostly used for walking and only in spring for limited grazing purpose. If the capacities of these areas are increased with the rehabilitation, they will contribute economically to both bovine and ovine husbandry in the villages as natural grazing areas.

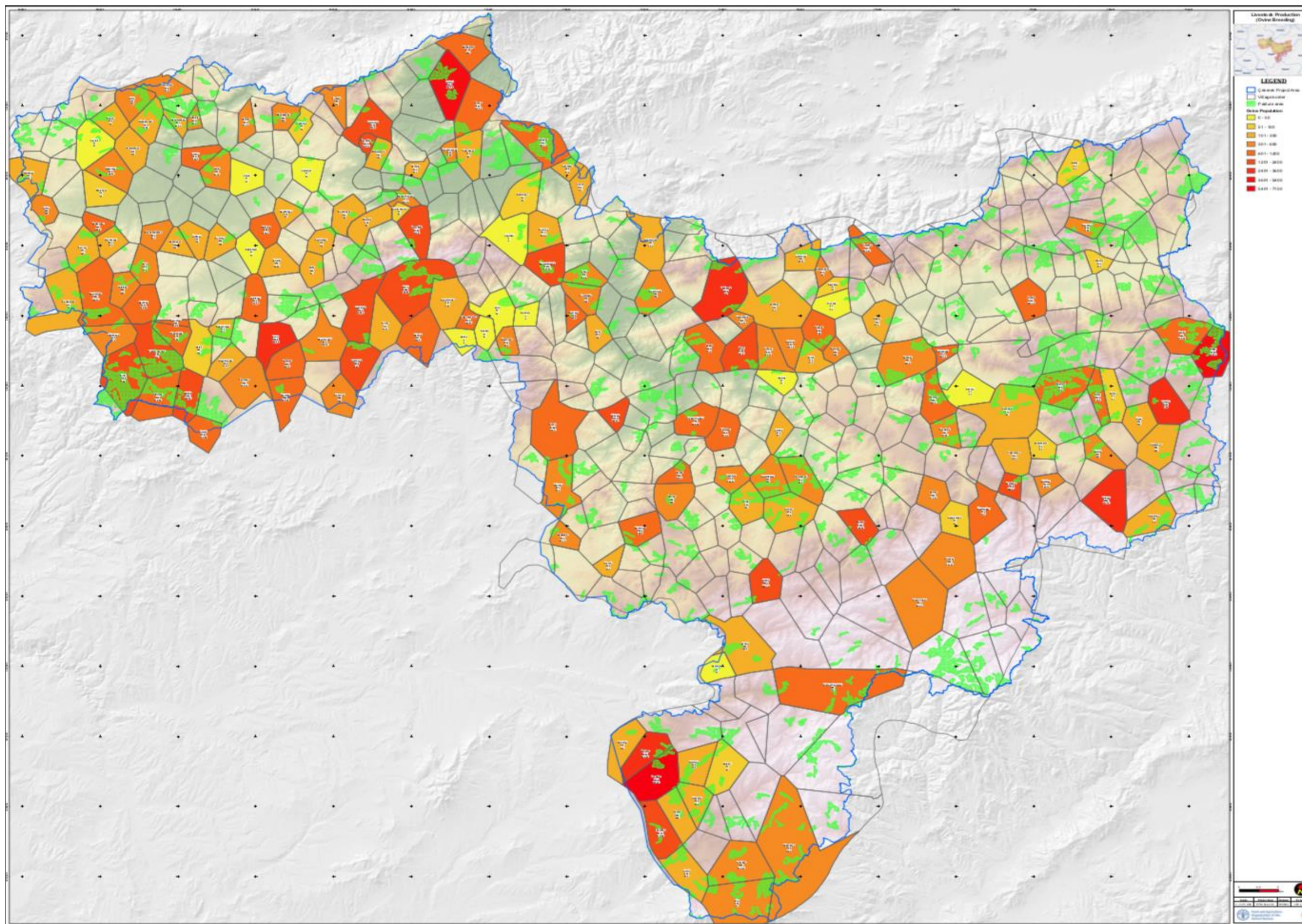


Figure 6-32 Locations of Pasturelands and Ovine Assets [Access Link](#)

Locations of pasturelands and ovine assets are shown in Figure 6-32. As Table 6-72 from the Household Survey shows, more than half of the households have less than 50 ovine and about 90% of participants have less than 200 ovine in CPA. Average number of ovine per agro-enterprises is also 164 according to 2019 data from ÇKS.

**Table 6-72 What is the Number of Ovine in your agro-business?**

Range	Frequency	Valid Percent	Cumulative Percent
1-10	10	35.80	27.60
11-20	2	7.10	42.90
21-50	3	10.70	53.60
51-100	6	21.40	75.00
101-200	4	14.40	89.40
200+	3	10.80	100.00
TOTAL	28	100.00	100.00

Source: Household Survey, Çekerek Project Area, 2020

### Poultry Farming in CPA

When the condition of egg poultry in Çekerek Project Area was considered, TurkStat data depicted in Table 6-73 suggests that there was almost 1 million chickens in 2015. From 2015 to 2019, number of chicken has decreased to 549,547. In other words, it is seen that the number of chickens owned by egg poultry enterprises in the region has decreased by approximately 40% in the last 5 years.

**Table 6-73 Number of Egg Poultry Assets**

Provinces of CPA	Districts of CPA	Egg Poultry (Pcs)		
Provinces	Districts	2015	2019	V*
Yozgat	Akdağmadeni	290,000	315,717	25,717
Yozgat	Aydincık	8,750	6,325	-2,425
Yozgat	Çayıralan	5,500	5,475	-25
Yozgat	Çekerek	4,000	5,016	1,016
Yozgat	Kadıışehri	11,250	11,600	350
Yozgat	Merkez	314,845	35,216	-279,629
Yozgat	Saraykent	0	4801	4801
Yozgat	Sorgun	252,000	108,000	-144,000
Tokat	Artova	3,240	3,445	205
Tokat	Sulusaray	6,000	5,300	-700
Tokat	Yeşilyurt	25,830	24,880	-950
Çorum	Alaca	7,214	10,452	3,238
Çorum	Ortaköy	4,200	4,820	620
Sivas	Yıldızeli	8,200	8,500	300
TOTAL		941,029	549,547	-391,482

Source: TurkStat (V\*: Variation)

It was determined that the main reason for the decrease observed in the total of the region depended on the decrease in the number of chickens of 423,629 in Merkez and Sorgun districts of Yozgat. When these two districts are not considered, it is concluded that egg poultry does not change much in other districts, and its change is generally in the direction of a slight increase. Furthermore, Akdağmadeni district of Yozgat had the highest number (315,717) of chicken followed by Sorgun district (108,000) in 2019. According to these figures, it makes Akdağmadeni the center of the CPA in egg poultry.



**Table 6-74 What is the number of chicken in your agro-enterprises?**

Range	Frequency	Valid Percent	Cumulative Percent
1-5	17	14.10	27.60
6-10	53	43.70	57.80
11-20	38	31.40	89.20
21-30	11	9.10	98.30
30+	2	1.60	100.00
TOTAL	121	100.00	100.00

Source: Household Survey, Çekerek Project Area, 2020

Considering the number of chickens owned by the households, almost 90% of the respondents of the HH survey have less than 20 chicken in their agro-enterprises. It is a strong indicator that poultry activities in the Project area are largely for domestic consumption.

**Table 6-75 Do you do chicken/egg sales activities?**

Answers	Frequency	Valid Percent
No Response	3	2.50
YES	4	3.30
NO	114	94.20
TOTAL	121	100.00

Source: Household Survey, Çekerek Project Area, 2020

In parallel, almost 95 percent of respondents answered “NO” in response to a question about the sale of chicken and poultry products.

### ***Beekeeping Activity***

TurkStat statistics presents that the number of registered beekeepers in the districts of the Project Area is only 541 (see Table 6-76). It could be stated that this low number has a decreasing trend compared to 2015. While the highest number of registered beekeepers is observed in Yıldızeli, one of the highest decrease (-134), after Merkez district (-145) of Yozgat, is recorded in this district as well. In 2019, total number of registered hives are approximately 40,000 in the Project Area.

**Table 6-76 Trends in Beekeeping Activities by Districts in CPA (2015-19)**

Province	Districts	Beekeeping Activities in 2015	Beekeeping Activities in 2019		Variation in number of Beekeepers (2015-2019)
		Total Number of Beekeepers	Total Number of Beekeepers	Total Number of Beehives*	
Yozgat	Akdağmadeni	76	57	3,583	-19
Yozgat	Aydıncık	14	5	183	-9
Yozgat	Çayıralan	65	37	2,804	-28
Yozgat	Çekerek	100	21	1,537	-79
Yozgat	Kadıışehri	17	17	944	0

Yozgat	Merkez	115	145	9,457	30
Yozgat	Saraykent	0	6	203	6
Yozgat	Sorgun	26	34	4,428	8
Tokat	Artova	15	15	642	0
Tokat	Sulusaray	8	7	404	-1
Tokat	Yeşilyurt	7	7	723	0
Çorum	Alaca	30	31	1,842	1
Çorum	Ortaköy	52	49	331	-3
Sivas	Yıldızeli	244	110	13,448	-134
<b>TOTAL</b>		<b>769</b>	<b>541</b>	<b>40,579</b>	<b>-228</b>

Source: TurkStat; Ministry of Agriculture and Forestry

## 6.2.4. Quality of Life and Living Conditions

### **Infrastructure**

According to the Yozgat Social Profile Research Project (ORAN, 2016), the most urgently needed service in their environment where the participants lived was the need for development of industry (44.7%), and this was followed by improvement on the infrastructure (10%); solutions for the problem of unemployment (10%); improvements in the health care services and related personnel (8%); improvements in the social and recreational facilities (7%); new investments (6%); maintenance of the public roads (5%); and improvements in education facilities (4%).

According to the same research, the most urgent need of Yozgat in general for the participants was the development of industry (52%). This was followed by solutions for the problem of unemployment (11%); improvements in the infrastructure (9%); new investments (4%); development of entertainment venues and social facilities (4%); improvement in the health facilities and the personnel (3%); improvements in educational facilities (3%) and the development of shopping centers (3%). In the study respondents were asked that if there was a future for them and your their children (if any) here. An overwhelming majority (70,1%) of the respondents did not see any future in Yozgat for themselves or for their children.

In the same research, when the people living in towns and villages are asked about what they would do first for the place they lived, over one third of them mentioned about the improvement in the infrastructure. This was followed by need for improvement in employment opportunities and improvement in social services such as health and education. Finally, quite a few people emphasized need for the development of agriculture and related livelihood sources (ORAN, 2016) (see Table 6-77 for further details).

**Table 6-77 What would be the first thing you would do for the place where you live?**

Categories	Women (%)	Men (%)
Infrastructure / Construction and Repair of Roads / Transportation Problem / Water Problem / Environmental Planning - Urban Planning / Natural Gas	37.8	33
Industry, Unemployment Problem / Employment, Agriculture and Livestock Support, Airport, New Investments	30.4	39.3
Education / School, Health institution and Staff	19.3	16.3
Development in the rural areas and rural livelihoods	12.5	11.6

Source: Yozgat Social Profile Research Project, 2016

According to the findings of Sivas Social Profile Survey (2016), 53% of the participants did not see a good future for themselves or for their children in the region they lived and 14% could not decide, therefore only 33% of the respondents were affirmative. The participants were also asked why they were negative about the future of the area 60% of them mentioned about the difficulty of a finding a job. Thirty-five per cent of them talked about the lack of educational opportunities and others mentioned about lack of social facilities and negative social environment.

Participants were also asked about the immediate needs of the place where they lived. Twenty-five per cent of them mentioned lack of industrial development, another 20% talked about the problem of unemployment, 18% mentioned about lack of social and entertainment facilities; 11% mentioned about lack of health and educational facilities and personnel, again lack of infrastructure mentioned by a similar proportion. These were followed by the lack of urban planning.

The fact that industry, unemployment and employment problems are at the forefront of the needed improvements mentioned by the participant also indicates why the province experiences influx of outgoing migration. Sivas province has lost a significantly part of its population since the 1970s and 3/5 of the population is no longer in the region. In the last 45 years, Sivas has been deprived of providing jobs, income and living opportunities to its growing population. Therefore, as emphasized by the participant the city is in need of investment in the infrastructure and creation of employment opportunities for its residents (Sivas Social Profile Survey, 2016).

The needs mentioned by people living in the rural areas of the Province differed slightly as the most mentioned need was infrastructure investments (24%). This was followed by industrial investments (13%); improvement in health and education services and personnel (11%); lack of social facilities (8%); unemployment mentioned by only 5%. This data indicates the lack of infrastructure and services in the rural areas (Sivas Social Profile Survey, 2016).

**Social Services (Health and Education)****Health**

Life expectancy at birth is one of the good indicators of public health in general as the lower life expectancy could be an outcome of high infant death rate, clinical risk factors, access to health services, high occupational mortality, lifestyle and so on. As highlighted earlier, the life expectancy at birth of the provinces located within the Çekerek River Basin does not differ much from the average life expectancy of Turkey. In fact, the life expectancy in Çorum which is 78.6 years is slightly higher than the average age for Turkey which is 78 (see Table 6-78 for further details).

**Table 6-78 Life Expectancy at Birth by Sex in CPA Provinces, 2015-2017**

Province	Male (Year)	Female (Year)	Total (Year)
Yozgat	74.7	80.3	77.5
Tokat	74.9	80.2	77.5
Çorum	75.9	81.5	78.6
Sivas	75.4	80.6	78.0
Turkey	75.3	80.8	78.0

Source: TurkStat

According to 2019 Health Statistics number of beds per capita in the basin is slightly higher than the average of Turkey. However intensive care units in most of the region seems below Turkey's average (See Table 6-79). Despite this statistic as seen above the urban and rural residents of the provinces located within the Basin complained about the quality of the health services and the lack of medical staff (2019 Turkey Health Statistics Yearbook).

**Table 6-79 Some Health Service Indicators by Province in CPA (2018)**

Province	Number of Hospital	Number of Bed	Number of Hospital Bed per 10.000 Population	Number of Qualified Bed	Number of Intensive Care Unit Bed	Proportion of Qualified Bed (Intensive care unit beds are not included.)	Intensive Care Unit Bed per 10.000 Population
Yozgat	16	1,286	30.5	1,069	124	92.0	2.9
Tokat	15	2,249	36.7	1,783	250	89.2	4.1
Çorum	16	1,658	31.2	1,235	245	87.4	4.6
Sivas	20	2,630	41.2	1,332	353	58.5	5.5
Turkey	1,538	237,504	28.6	147,655	39,955	74.7	4.8

Source: Health Statistics Yearbook 2018

In fact, when the population per Specialist Physician; the population per Physician; the population per dentist; and the population per pharmacist is concerned the general situation in the Basin is below the country average. This evidence supports the claims by the residents about the lack of medical staff in social studies reviewed above. However, the region seems to be doing well in the number of nurses and midwives as their proportion is above Turkey's average (see

Table 6-80).

**Table 6-80 Number of Healthcare Personnel by Province (2018)**

Province	Population per Specialist Physician	Population per Physician (GP/SP/MR)	Population per dentist	Population per Pharmacist	Population per Nurse	Population per Midwife
Yozgat	1,507	657	5,059	2,852	392	995
Tokat	1,451	657	2,954	2,823	371	1,103
Çorum	1,386	699	4,224	2,579	348	1,122
Sivas	1,156	536	2,639	2,751	333	1,064
Turkey	1.,03	543	2,716	2,596	437	1,476

Source: Adopted from 2018 General Directorate of Health Services; Table:10.10 (pp.251-2) and TurkStat

In Yozgat, although public investments continue in the field of health, improvements are still needed in terms of physical, technical and technological infrastructure and health personnel. Furthermore, in the province, it is especially important to prevent rabies and related biting cases and to develop preventive healthcare practices for Hepatitis B, Tuberculosis and Burucella. Yozgat is among the provinces at high risk in terms of Congo Hemorrhagic Fever.

It is observed that the number of specialist physicians in Tokat province is insufficient, as is the case throughout the country. In 2014, the number of physicians per 10,000 people was 12, while the number of specialist physicians was 7. However, there are important differences between districts. The number of family physicians in the province was 173 in 2014 and the number of family physicians per 10,000 people was 2.9. There are Integrated District Hospitals in 5 districts of the province (Artova-Başçıftlık-Pazar-Sulusaray-Yeşilyurt). There are no specialists in these hospitals. People living in these districts come to the Central District for examination. Specialist physician inadequacy is felt in areas such as Pediatric Surgery, Gastroenterology, Cardiovascular Surgery.

The insufficient number of specialist doctors in the districts of Çorum and the absence of all necessary diagnostic and treatment tools increase the rates of referrals to provincial centers. The number of family physicians in the province was 167 in 2014 and the population per family physician is 3,157. The main health problems of the province are the insufficient number of personnel providing health services and significant differences in the provision of health services between districts. Statistics show that inpatient health institutions are still inadequate in terms of equipment and staff.

In 2015, the number of people per bed in Sivas decreased significantly compared to 2002 (2002: 315.5; 2014: 250.1). On the other hand, the number of people per hospital doubled from 2002 compared to 2010 (2002: 346297; 2010: 627056) (ORAN, Sivas 2017: 47).

According to the 2014 Public Health Directorate surveillance data, when the number of communicable diseases in 2014 was examined, 263 of the 397 communicable diseases, corresponding to 66.2%, were found in the Center of Yozgat. 95.4% of infectious diseases seen in Yozgat Center are bites with rabies. The share of suspected rabies bite in all infectious diseases is 75.5%. Yozgat Center is followed by Boğazlıyan with 38 cases making 9.5% of the total number of cases. Among 397 cases in total throughout Yozgat, rabies suspicious bite rate is followed by 38 Hepatitis-B cases, 25 Tuberculosis cases, 17 Brucella cases, 8 Hepatitis-C cases.

In addition to these, all provinces in the basin are among the 20 most risky provinces in terms of Crimean Congo Hemorrhagic Fever. Yozgat is especially mentioned among the risky provinces. In 2015, ticks were removed from 3,937 people in the city. The highest number of

people removed ticks was seen in Akdağmadeni (n = 964), Çekerek (n = 916) and Kadışehri (n = 604), respectively.

In terms of combating the Covid-19 pandemic, the vaccination rates of the provinces in the basin are medium and high (see Figure 6-33).



Figure 6-33 Covid-19, at least two dose vaccination Turkey map

Source: Ministry of Health, 11 November 2021

**Education**

According to the 2020 TurkStat data, the distribution of the population of the provinces in the CPA by education level (except for unknown cases) is presented below.

Table 6-81 Distribution of the population by education level in affected provinces

Level	Çorum		Sivas		Tokat		Yozgat	
	N	%	N	%	N	%	N	%
Illiterate	19 559	4.05	25 867	4.45	13 452	2.44	13 681	3.61
Literate without a diploma	52 131	10.78	55 353	9.52	66 633	12.11	39 172	10.34
Primary school	133 367	27.59	134 055	23.06	144 844	26.32	104 079	27.47
Primary education	42 509	8.79	40 234	6.92	44 938	8.17	27 478	7.25
Junior and vocational high school	82 927	17.15	107 920	18.57	99 635	18.10	68 049	17.96
High and vocational high school	87 765	18.15	126 107	21.70	104 172	18.93	74 943	19.78
Universities and other higher educational institutions	56 255	11.64	76 399	13.14	67 633	12.29	39 530	10.43

Master (Including 5 or 6 Years Faculties)	4 360	0.90	6 744	1.16	5 398	0.98	2 947	0.78
Doctorate	835	0.17	1 709	0.29	1 231	0.22	650	0.17

Source: Adopted from Turkstat, 2020

The level of education considered here is derived from Provincial level data however, the Table 6-82 below focuses on the education level of the people living in the CPA district and their villages. As can be seen from the Table 6-82 education level is quite low in the Project Area.

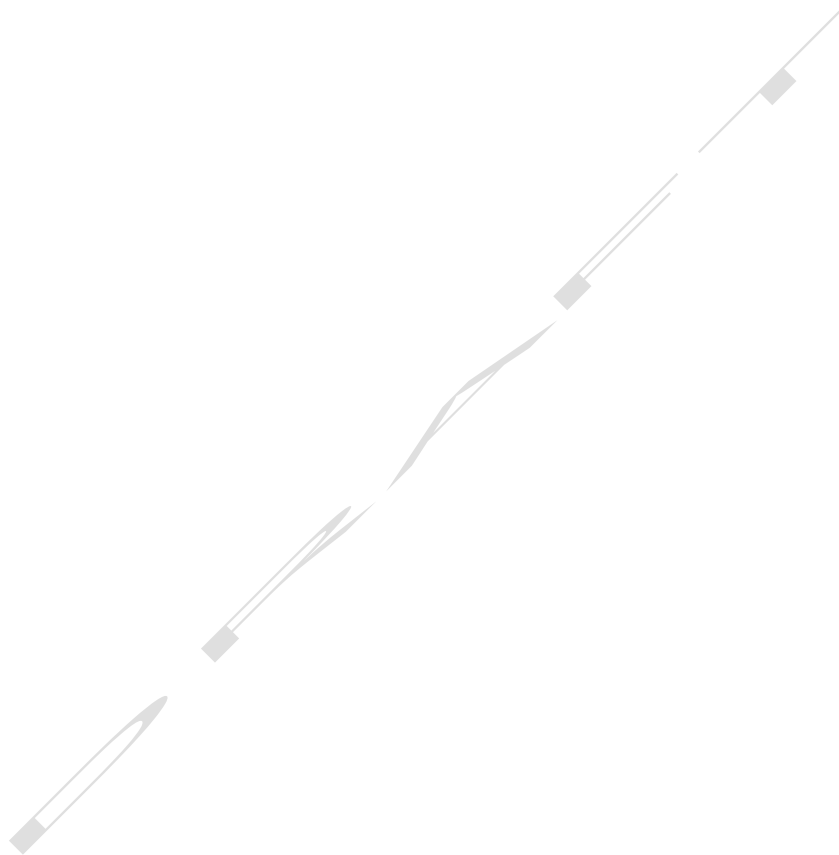


Table 6-82 Education Level for Age 15+ in CPA Provinces

Province	District	Education Level																	
		Illiterate		Literate without formal education		Elementary School Graduate		Primary Education Graduate		Secondary School or Equivalent Graduate		High School or Equivalent Graduate		University Graduate		Post Graduate		Unknown	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yozgat	Akdağmadeni	1,332	4.07	2,776	8.48	8,821	26.96	2,953	9.03	6,730	20.57	6,257	19.12	2,833	8.66	209	0.64	809	2.47
	Aydıncık	843	10.64	767	9.68	2,053	25.91	835	10.54	1,751	22.09	1,169	14.75	439	5.54	26	0.33	42	0.53
	Kadıışehri	597	6.93	412	4.78	2,771	32.16	859	9.97	2,162	25.09	1,120	13.00	564	6.55	43	0.50	89	1.03
	Merkez	2,203	2.71	1,854	2.28	14,625	18.00	6,359	7.83	13,492	16.61	26,213	32.26	14,129	17.39	1,723	2.12	647	0.80
	Saraykent	381	4.08	913	9.77	3,002	32.13	981	10.50	1,840	19.69	1,328	14.21	535	5.73	38	0.41	326	3.49
	Sorgun	3,162	5.31	2,850	4.78	15,136	25.41	6,031	10.12	12,300	20.65	11,632	19.53	6,215	10.43	570	0.96	1,678	2.82
	Çayıralan	453	4.36	1,042	10.04	3,060	29.47	875	8.43	1,600	15.41	1,872	18.03	784	7.55	52	0.50	645	6.21
	Çekerek	1,276	8.28	1,024	6.64	4,861	31.53	1,507	9.77	3,013	19.54	2,371	15.38	1,132	7.34	113	0.73	122	0.79
Tokat	Artova	218	3.13	751	10.80	2,198	31.60	635	9.13	1,283	18.44	1,211	17.41	600	8.63	43	0.62	17	0.24
	Sulusaray	124	2.18	619	10.87	1,621	28.46	797	13.99	1,310	23.00	771	13.54	399	7.01	21	0.37	33	0.58
	Yeşilyurt	239	3.55	810	12.04	1,812	26.94	768	11.42	1,667	24.78	916	13.62	433	6.44	29	0.43	53	0.79
Çorum	Alaca	1,387	5.51	1,915	7.60	8,181	32.48	2,013	7.99	4,866	19.32	4,222	16.76	2,260	8.97	153	0.61	192	0.76
	Ortaköy	406	6.78	620	10.35	1,609	26.85	844	14.09	1,081	18.04	954	15.92	442	7.38	23	0.38	13	0.22
Sivas	Yıldızeli	1,968	7.64	2,050	7.95	7,210	27.98	2,872	11.14	5,460	21.19	3,915	15.19	1,622	6.29	84	0.33	589	2.29
Turkey			3.22		4.18		19.96		9.50		19.66		24.60		16.34		2.10		0.86

Source: Adopted from TurkStat, 2019

According to the results Transition to Higher Education examinations such as LYS and LGS scores in students' college entrance exams in the province is quite close to the average of Turkey in 81 provinces (See Table 6-83). This situation can be interpreted in two ways. The first interpretation is that children who continue their education until university are more successful because they have higher socio-economic status. The second comment is that young people in the Basin provinces will be successful in education if they are given the opportunity in education. Which interpretation coincides with the reality or whether there are different explanations will be one of the issues discussed in the SESA field study.

**Table 6-83 Higher Education Examination Scores of Students in CPA Provinces (2019)**

Rank	Province	Basic Proficiency Exam (TYT)	Qualitative	Quantitative	Weighted	Language	Over all Average
	<b>Turkish Average</b>	<b>1,127,051</b>	<b>613,409</b>	<b>638,361</b>	<b>757,901</b>	<b>50,203</b>	<b>637,385</b>
25	Çorum	1,073,539	604,793	635,068	749,095	46,530	621,005
34	Yozgat	1,110,038	578,083	645,812	751,944	53,069	627,787
35	Sivas	1,093,786	593,369	646,219	757,073	50,240	628,137
40	Tokat	1,120,200	605,894	631,456	746,452	49,198	630,640

Source: YÖK 2019, adopted from various tables

In line with the distribution of the residents of the basin provinces according to the provinces they have settled in to study undergraduate or associate degree (except Open Education Faculty), 60.2% of the students in Sivas province; 64.6% of the students in Tokat province; 77.8% of the students in the city of Yozgat and 79.6% of the students in the province of Çorum went to other provinces to receive higher education (Council of Higher Education, 2019).

According to CLQ (2020) data, the distribution of the population by education level is given in the table below.

**Table 6-84 Distribution of the population by education level**

Level	Yozgat		Corum		Sivas		Tokat	
	N	%	N	%	N	%	N	%
Population that has never been to school and is illiterate	1051	3.94	119	2.67	309	6.67	217	3.62
Population that has never been to school but can read and write	1099	4.12	268	6.01	291	6.28	271	4.52
Primary school graduate population	9922	37.17	1698	38.09	1422	30.68	1575	26.24
Primary school student population	1519	5.69	185	4.15	169	3.65	407	6.78
Middle school graduate population	5233	19.61	976	21.89	802	17.30	1165	19.41
Middle school student population	1274	4.77	153	3.43	174	3.75	475	7.91
High school graduate population	2645	9.91	326	7.31	782	16.87	466	7.76
High school student population	1038	3.89	133	2.98	141	3.04	415	6.91
University graduate population	744	2.79	96	2.15	157	3.39	135	2.25

University student population	526	1.97	50	1.12	195	4.21	327	5.45
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Source: Çekerek Field Study (CLQ), 2020

### *Spare Time Activities and opportunities for socializing*

According to Yozgat Social Profile Survey (2016), participants were asked what they did in their spare time. The answers given included: 44.5% watching TV; 37.5% visiting spouses, friends and relatives; 19.3% visiting mothers and fathers; 15.0% reading books; 13.3% visiting neighbors; 12.9% spent time at the coffee house; 11.9% going to the mosque; 9.5% doing sports; and the remaining 6.6% mentioned about doing gardening, going to the theater, participating in political party activities, going to the Quran course/reading the Quran, participating in charity activities, and doing handicraft. When these activities are evaluated, it is seen that 80% of the population is quite passive (such as watching TV) in their spare time activities. Only one fifth of the population spends their free time productively and actively.

The participants like to spend the most of their time with; 52.6% with friends; 13.5% parents; 9.0% with relatives; 7.8% with siblings; 6.3% with neighbors; 3.6% with my family; 1.6% with their spouse. The fact that friends are mostly preferred to spend time with and the proportion of family members is low that indicates that social relations change from extended family to nuclear family. The rate of activities participants do while spending time with their friends or family include; 40.7% to chat; 39.5% to travel somewhere; 13.7% to watch TV; 10.4% to have a picnic; 10% to take care of a hobby; 9.7% to spend time with family and relatives; 8.7% doing sports; 7.5% working; 6.7% going to coffee shops; 5.9% spending time with friends; 5.2% attending neighbor visits / conversations; 4.2% going to the movies / watching movies; 3.2% having fun; 2.4% is going to mosque; and 1% is shopping.

Sivas Social Profile Survey (2016) also show very similar patterns compared to Yozgat report (2016). During the field studies carried out no information on spare time activities and opportunities could be collected, this information will be collected while preparing sub-project specific environmental and social documents to be prepared.

Table 6-85 below shows the number of books in public libraries in the provinces of the Basin and in Turkey. It is seen that since 1995 the books in all libraries mentioned here had been increasing in significant numbers. However, as can be seen in the Table 6-86 while the number of people who use public libraries in the provinces of the Basin and Turkey shows some interesting trends. The number of people using the public libraries in Turkey had been increasing since 1995 and similar trends had been observed in the Tokat Province which is located within the CPA as well. On the contrary despite observing increase in the number of books in public libraries of the provinces of Çorum, Sivas and Yozgat the number of people visiting the public libraries where these books are deposited had been decreasing significantly since 1995.

**Table 6-85 Number of Books in Public Libraries in CPA Provinces (1995-2018)**

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
1995	11,170,720	193,814	225,194	125,035	103,059
2000	12,809,225	211,242	257,142	145,568	132,562
2005	12,948,460	223,739	296,061	153,891	148,024
2010	14,528,550	262,931	333,246	164,801	167,470

2015	18,097,101	312,490	410,667	202,966	202,438
2018	19,966,573	360,613	459,194	230,517	227,392

Source: Adopted from TurkStat

**Table 6-86 Number of People that use Public Libraries CPA Provinces (1995-2018)**

Years	Turkey	Çorum	Sivas	Tokat	Yozgat
1995	23,512,442	953,582	836,043	267,379	393,427
2000	19,975,215	555,609	659,753	208,300	240,287
2005	20,706,526	421,947	456,255	187,510	163,618
2010	19,280,441	529,534	326,678	265,035	135,691
2015	23,529,016	513,646	390,399	309,257	119,464
2018	28,242,986	518,880	788,951	321,788	146,417

Source: Adopted from TurkStat

### **Quality of Life and Living Conditions in the CPA settlements according to CLQ**

In the CLQ muhtars were asked about access to utilities, services and also about the quality of infrastructure in their settlements. According to the statements of muhtars only one settlement out of 176 did not have electricity. However, 30% of these settlements reported some problems with the electricity supply. The most common problem was the old age of the system. It is being very old and lacking maintenance work caused a regular electricity cut. Again, only one muhtar declared that there was no road to the settlement. However, for the 59.43% of the settlements the existing roads were not sufficient enough. Community assets / infrastructure opportunities in the 177 settlements were asked to the mukhtars to examine their living conditions, and negative answers were received at the following rates.

**Table 6-87 Settlement based infrastructures**

Opportunity	NA		If available, not sufficient		Un-sufficiency
	N	%	N	%	
Electricity	1	0.57	50	28.57	Neglected and old infrastructure
Road	1	0.57	104	59.43	Neglected, unrepaired, unpaved, narrow and dangerous roads
Drinking water	2	1.14	0	-	-
Internet	60	34.09	74	63.79	Lack of connectivity, phone or home internet deficiencies
Telephone	8	4.54	73	43.45	Lack of connectivity
Public transportation	71	40.34	14	13.33	Only taxi
Market / shop	129	73.29	5	10.63	Small or closed in winter
Place of worship (Mosque and Cem house)	0	0	23	13.07	They need renovations, they are neglected, there is no mosque imam, there is no mosque minaret.
Cemetery	1	0.57	13	7.43	Needs expansion/insufficient space, neglected, poor landscape, not surrounded by walls/fences
Social place	130	74.28	10	22.22	Limited areas
Public education centers					

Source: Çekerek Field Study (CLQ), 2020

Muhtars of only two settlements mentioned about lack of running water in their settlements. As reported by the muhtars 42% of the drinking water networks in the settlements were constructed before 1990 and 78% before 2000. Therefore muhtars frequently mentioned about the lack of maintenance and poor quality of their drinking water supply.

According to muhtars, there was no internet in 34% of the settlements. Fifty-five per cent of the settlements where there was internet connection in place did not have a regular access to the internet due to inadequate infrastructure. Lack of internet and inadequate internet related infrastructure became more pronounced under the Covid 19 conditions as most of the students in the settlements needed to have access to online education.

According to the statements of the muhtars none of the 176 settlements that responded to the CLQ had a public education center. Furthermore, a substantial majority of these settlements (95%) lacked market place and a further 74% did not have any shops.

As far as the worship facilities were concerned, 148 of the settlements had a mosque and 28 had cemevi (a house of gathering for Alevi people).

As far as the quality of life, access to health and education services and also utility provisions and infrastructure facilities were concerned, as evident from the CLQ, settlements in the CPA have serious access problems which adversely affect the quality of live of the people.

As far as the access to health facilities in the settlements were concerned, 81% of the settlements did not have a health clinic (see Table 6-88). However, 35 settlements that had a health clinic reported some problems such as inactivity, lack of personnel or equipment.

**Table 6-88 Is there a health clinic in your settlement?**

Answer	Frequency	Percent
Yes	35	19
No	142	81

Source: Çekerek Field Study (CLQ), 2020

Muhtars were also asked about the existence of elementary school in their settlements and 84% of them responded by saying “no” (see Table 6-89 for further details). As far as muhtars’ statements were concerned all settlements used to have elementary school and 86% of them closed down between 1990 and 2010.

**Table 6-89 Is there elementary school in your settlement?**

Answer	Frequency	Percent
Yes	28	16
No	148	84

Source: Çekerek Field Study (CLQ), 2020

Mobile education is common in settlements across the CPA. Students go to schools in district centers or nearby and bigger settlements those have enough education infrastructure by bus. It was learned that out of 177 settlements, 148 do not have primary school, 154 do not have a secondary school, 172 do not have high school, and 150 do not have kindergarten. There are no adult public education centers in any of the settlements. Only 21 of the settlements (12%) had secondary school; and 3 (2%) had high school. There were nursery or kindergarten in 26 (15%) of the settlements.

## 6.2.5. Social Relations

### *Intercultural interactions*

According to the data of Yozgat Provincial Directorate of Culture and Tourism (2015), there are Circassian, Georgian and Alevi villages in Yozgat. The villages where these are concentrated by districts are presented below. During the implementation of the HHQs it has been considered to include these villages into the sample.

Circassian villages: District of Aydıncı: Bakırboğazi, Ağıllı, Kuşsarayı, Mercimekören; district of Boğazlıyan: Poyrazlı; district of Sarıkaya: Arpalık, Boyalık, Kargalık, Karabacak, Karelli; district of Sorgun: Osmaniye. These settlements are not within the Project Area.

Alevi Villages: Central district of Yozgat: Aktaş, Bayatören, Büyükmahal, Büyükcincirli, Çorak, Deremahal, Derekışla, Kababel, Kaşkışla, Kırıksoku, Köçekkömü, Kuyumcu, Pembecik, Sarımbey, Sarınınören, Tayip; district of Aydıncık: Güroğlu, Küçüktoraman, Sakızlık; district of Çekerek: Kamaşçık, Sarıköy; district of Sorgun: Sivri, Tulum, Bahadın; and district of Şefaattli: Arife. The italicized settlements above are within the project area.

Since Sivas is the intersection point of roads in the east-west and north-south directions and an important crossroad on the Silk Road, Sivas has been a city that receives and gives migration throughout history. After the loss of Kars and its region as a result of the 1877-1878 Ottoman-Russian War, which is known as the 93 War in history, there have been migrants from this region to Sivas province. Again, during the Circassian exile, which started in 1863 and whose effects lasted until the 20th century, some Circassian communities were settled in Sivas, especially Şarkışla, Yıldızeli districts. In addition to these, citizens of Kurdish origin live intensely in the districts of Sivas close to Eastern Anatolia Region. The number of citizens of Avşar origin is very low compared to Circassians.

Sivas can be divided into two groups as Sunni and Alevi sect. The birth of Alevism in the region dates back to the end of the 15th century. Pir Sultan Abdal lived in Sivas. Sunnis and Alevis live together in Sivas. So much so that there are many villages where Alevis and Sunnis live together. The “kirvelik” culture, which has been applied for centuries in order to increase the relations between the Sunni and Alevi sections, still continues, even if a little. Although there are negative memories such as the Madimak Incidents in 1993, there is no clear animosity between people of both sects.

## 6.2.6. Vulnerable Groups

### *Disadvantaged/Vulnerable Groups in Local communities*

In the scoping process it has been established that there were some other potentially vulnerable groups in the Basin. Therefore, approximate numbers of vulnerable groups were learned through CLQ.

**Table 6-90 Vulnerable Groups in CPA**

Vulnerability	Gender	Number of settlements containing vulnerable individuals	Number of vulnerable individuals detected
Female Head of Household		137	1644
Widow Childless Woman		23	58

A child who does not go to school even though (s)he is of education age	Boy	6	14 <sup>27</sup>
	Girl	8	17 <sup>28</sup>
People with physical disability	Man	97	222
	Woman	75	150
People with mental disability	Man	80	153
	Woman	59	82
Homebound due to chronic illness	Man	26	50
	Woman	26	52
Home dependent due to patient, elderly, disabled care	Man	24	43
	Woman	63	158
Does not speak Turkish	Man	0	0
	Woman	2	2
Very old living alone	Man	84	336
	Woman	94	456
Shepherd woman with no livestock	Man	48	240
	Woman	1	20
Poor peasant woman living on social assistance	Man	113	665
	Woman	112	667

Source: Çekerek Field Study (CLQ), 2020

According to the information received from the headmen, 1 to 80 households in 76 settlements are landless and continue their agricultural activities only on lands belonging to others. The total number of landless households identified within the scope of the field study is 1,791 (CLQ, 2020).

Information was also obtained about the population of different religions, sects and ethnic origins living in the CPA. The population of Alevi and Bektashi in 50 settlements was determined as 5,008. A population of 75 Hanafi lives in a settlement. People from different ethnic backgrounds live in 62 settlements. Different ethnicities are Afghan, Azeri, Circassian, Moroccan, Moroccan, Georgian, Kurdish, Syrian, Yoruk Turk (CLQ, 2020).

Gender issues is presented in a separate *Chapter 8 GENDER ANALYSES*. While information was collected on different ethnic groups by settlement, more detailed analyzes of groups outside the local community, such as refugees and seasonal agricultural workers, are presented below.

### **Refugees**

Although very few in numbers Syrian refugees were used in the agriculture as wage labourers in the Basin. Report published in 2016 titled "Foreign Migrant Workers in Seasonal Agricultural

<sup>27</sup> Reasons: not sending the family to school, disability, financial inadequacy, failure and unwillingness in school lessons

<sup>28</sup> Reasons: disability, financial inadequacy, failure and reluctance in school lessons, intellectual disability, not wanting to go to school

Production in Turkey” mentioned Syrian refugees working in agriculture in the provinces of Çorum, Sivas, Tokat and Yozgat.

According to data from Directorate General of Migration Management for March 2022, 3,763,565 registered Syrians lived in Turkey. This figure corresponds to 4.44% of Turkey's population. This proportion is higher than the average for the provinces of the CPA (for further details see Table 6-91).

**Table 6-91 Syrian Refugees in Turkey and in CPA Provinces (2021)**

Location	Number of Syrian refugees on record	Total population	Percentage of Syrian refugees compared to overall population %
Turkey	3,763,565	84,680,273	4.44
Yozgat	5,571	418,500	1.33
Tokat	1,233	602,567	0.20
Çorum	3,443	526,282	0.65
Sivas	3,616	639,121	0.57

Source: <https://www.goc.gov.tr/gecici-koruma5638>

According to current data provided by the Directorate General of Migration Management (March 2022) in Turkey, residence permission was granted to 1,401,849 people coming from countries such as Iraq, Turkmenistan, Iran, Syria, Uzbekistan, Russian Fed., Azarbaican and Kazakhstan. Of these, only 8,292 people reside in the provinces of the Basin. The distribution of these people by province can be seen in Table 6-92 below.

**Table 6-92 Overseas Migrants with Residence Permits in CPA Provinces (2022)**

Province	Numbers
Yozgat	1,803
Tokat	2,558
Çorum	1,976
Sivas	1,955

Source: <https://www.goc.gov.tr/ikamet-izinleri>

### **Seasonal Agricultural Workers**

In the CLQ muhtars were asked about the seasonal agricultural workers in their settlements. It has been stated that 76 (43,2%) settlements out of 176 received seasonal agricultural workers on a regular basis (see Table 6-93 for further details). Muhtars were also asked about the geographical origins of these workers and the most frequently mentioned province was Şanlıurfa. This was followed by Mardin, Diyarbakır, Gaziantep, Adıyaman, Van and Bitlis. These provinces are located in Eastern and Southeastern Turkey. There were also few mentions about provinces in the immediate vicinity or settlements within the CPA. Six muhtars mentioned about having Afgani seasonal agricultural workers in their settlements and another 5 mentioned having Syrian workers.

**Table 6-93 Do you receive seasonal agricultreel workers in your settlement?**

Answers	Frequency	Percent
Yes	76	43,2
No	100	56,8

Source: Çekerek Field Study (CLQ), 2020

According to muhtars statements the seasonal workers come to CPA throughout Spring to Autumn months. Some of these seasonal workers came as shepherds but a substantial majority of them worked in tilling the land, sowing, planting, irrigation work and cultivating. In other words they performed general agricultural tasks in sugar beet, lentils and chickpea and animal farming. Some settlements had quite a few seasonal agricultural workers and other as many as 500 per annum. On average each seasonal agricultural worker receiving settlement had 65 workers. Out of 76 settlements that received seasonal agricultural workers 61 had women among these workers. These settlements had between 20 and 70 women workers during the agricultural season. Fifty-nine of these settlements had seasonal agricultural workers below the age of 16. These settlements on average had 25 seasonal child labourers working in agriculture. In these 76 settlements seasonal agricultural workers either received their wages through mediator / labor broker or directly (see Table 6-94 for further details).

**Table 6-94 How do seasonal agricultural workers receive their wages?**

Answers	Frequency	Percent
Through mediator /labor broker	32	43
Directly	42	57

Source: Çekerek Field Study (CLQ), 2020

Muhtars were also asked about the type of accommodation provided for the seasonal agricultural workers. In the majority of the settlements (73%) these workers lived in tents. This was followed by workers living in empty schools (11%), prefabricated houses or containers (5%) and in empty schools (5%) (see Table 6-95).

**Table 6-95 Accommodation of seasonal agricultural workers**

Accommodation	Frequency	Percent
Tent	47	73
Empty school	7	11
Prefabricated house / container	5	8
Empty house	5	8

Source: Çekerek Field Study (CLQ), 2020

Because of the type of accommodation the seasonal agriculture workers live, these places lack basic utilities and services. For example it has been reported that almost 40% of the accommodations did not have any running water (for drinking or general purposes). Seventy-five per cent of their accommodation did not have any electricity. Seventy-eight per cent of them either did not have any toilet facilities or toilets facilities provided for them were substandard (such as a hole on the ground without any running water). Seventy-nine per cent of them did not have bathrooms either.

As far as the relations between seasonal agricultural workers and the local people were concerned, according to 88% of the muhtars, there were no problems in their settlements. However, 12% of the muhtars reported some problems. Money and wage related issues were the main reasons for this conflict but the cases of sexual harassment towards local women were also reported.

Child labor in the agricultural sector is an integral part of the seasonal agricultural workers as children themselves do not move around the country themselves, the agricultural labourers move around the country as family units including the children.

2014 Survey of the Seasonal Agricultural Work in Turkey, mentions Yozgat as one of the regular seasonal agricultural worker receiving cities during the sugar beet hoeing season. Report also mentions the child labour and emphasizes that seasonal agriculture labour involves risk and particularly in Yozgat these child labourers develop hernia and suffer from it. The report also mentions local Roma community working as wage labourers in agriculture in the district of Yozgat-Boğazlıyan and comments about the discrimination experienced by the members of this community. The researchers also came across relatively fewer Syrian refugees in the rural areas of Yozgat where sugar beet is a major production and one of the main sources of seasonal labor. Farmers in the region explained the hoeing process to be an important stage in sugar beet production, with yields suffering if hoeing is not done properly. In other words, farm owners mostly prefer “experienced” laborers. Therefore they prefer inexperienced Syrian labourers in desperate situations.

The report titled “Seasonal Agricultural Work and Children” (2013) focused on child laborers aged between 6 and 14. The report also conducted study amongst child laborers working in sugarbeet harvest in Yozgat. According to the research in Yozgat, the proportion of children who work in the field is similar for boys and girls yet it is mostly girls who carry out domestic chores such as carrying water, caring for siblings, washing dishes, preparing meals, and cleaning.

According to CLQ findings, seasonal agricultural workers come to 76 of the affected settlements at certain times of the year. Children (under 16 years old) are among the seasonal workers who come to 58 villages.

**Table 6-96 Ratio of children among seasonal agricultural workers**

Proportion of children	Frequency	Percent
5%-15%	10	17.24
20%-30%	38	65.52
40%-50%	9	15.52
60%	1	1nok72
<b>Total</b>	<b>58</b>	<b>100</b>
<i>No children</i>	14	
<i>No answer and No seasonal workers</i>	105	
<i>Grand total</i>	177	

Source: Çekerek Field Study (CLQ), 2020

### 6.3. Cultural Heritage

As stated earlier in the section on tourism the provinces in the Çekerek Project Area are extremely rich in cultural heritage. Yozgat, also known as Bozok Plateau, has been inhabited since the First Ages. The province contains natural beauties, promenade places, high plains, historical, cultural, touristic values and thermal springs.

The ruins of the ancient city of Sebastapolis, in Sulusaray one of the five largest cities of the Black Sea on the east-west and north-south route during the Roman period and the rich ancient city with the authority to coin money, and the autonomous city of Komana, which was the religion and trade center of the Kingdom of Mitridat in Northern Anatolia survived until today and this is just one to mention.

In Tokat, where there are 510 items registered by the Cultural and Natural Heritage Preservation Regional Directorate, 262 of these works are examples of civil architecture, 117 of them are religious buildings, 70 of them are cultural buildings, 16 of them are natural assets, 4 of them are commercial building and 1 military building. There are 112 archaeological sites, 3 urban sites, 2 natural sites and 1 historical site in the province with 118 protected areas.

Tokat is one of the rare Anatolian cities that preserves its historical and cultural heritage and Tokat has a deep-rooted cultural history of about 7500 years. For this reason, the ruins of many civilizations established in ancient times are found in the region. Maşat Höyük, Horoz Tepe, Komana and Sebastopolis are settlements established in Tokat in ancient times.

Alacahöyük, which is one of the first human settlement areas in Anatolia, Hattusa, the capital of the Hittites, and Sapinuva, which is a kind of trade center of the Hittite State, are located in the province of Çorum. However, there is no detailed information about the cultural heritage sites that might have risks of impact from the project in the CPA. In the community level survey (CLQ), the extent of tangible cultural heritage in the settlements of CPA were investigated further. Muhtars reported that there were historical, religious sites and archeological sites/protected areas in 77 settlements as listed below in Table 6-97.

**Table 6-97 Historical, religious, archeological sites in CPA Provinces**

Province	District	Settlement	Any historical, religious sites?	Is it under protection?	Any archeological site/protected area?
Corum	Alaca	Akpınar	Available	yes	Available
Corum	Alaca	Çalköy	Available	yes	Available
Corum	Alaca	Gerdekkaya	Available	yes	Available
Corum	Alaca	Kalınkaya	Available	yes	Available
Corum	Alaca	Külah	Available	yes	Available
Corum	Alaca	Yatankavak	Available	not known	Available
Corum	Alaca	Gökören	Available	not known	NA
Corum	Alaca	Akçaköy	Available	not known	NA
Corum	Alaca	Büyükcamili	Available	not known	NA
Corum	Alaca	Çatalkaya	Available	no	NA
Corum	Alaca	Çelebibağı	Available	not known	NA
Corum	Alaca	Çırçır	Available	not known	NA
Corum	Alaca	Değirmenönü	Available	not known	NA
Corum	Alaca	Koyunoğlu	Available	no	NA
Corum	Alaca	Küre	Available	no answer	NA
Corum	Alaca	Gazipaşa	NA	NA	Available
Corum	Alaca	Velet	NA	NA	Available
Corum	Ortaköy	Fındıklı	Available	yes	Available
Corum	Ortaköy	Yukarıkuyucak	Available	yes	NA
Sivas	Yıldızeli	Çöte	Available	yes	Available
Sivas	Yıldızeli	Çukursaray	Available	yes	Available
Sivas	Yıldızeli	Ortaklar	Available	yes	NA
Sivas	Yıldızeli	Subaşı	Available	yes	NA
Sivas	Yıldızeli	Davulalan	NA	NA	Available
Sivas	Yıldızeli	Yavu	NA	NA	Available
Tokat	Artova	Bebekderesi	Available	no	NA
Tokat	Artova	Gümüşturt	Available	yes	NA

Province	District	Settlement	Any historical, religious sites?	Is it under protection?	Any archeological site/protected area?
Tokat	Artova	Salur	Available	yes	NA
Tokat	Artova	Ahmetdanişment	NA	NA	Available
Tokat	Artova	Boyunpınar	NA	NA	Available
Tokat	Artova	Tuzla	NA	NA	Available
Tokat	Sulusaray	Uylubağı	Available	yes	Available
Tokat	Sulusaray	Balıkhisar	Available	yes	NA
Tokat	Sulusaray	Dutluca (Malum Seyit Tekke)	Available	yes	NA
Tokat	Yeşilyurt	Büget	Available	not known	NA
Tokat	Yeşilyurt	Sekücek	Available	not known	NA
Tokat	Yeşilyurt	Sivri	Available	not known	NA
Tokat	Yeşilyurt	Doğlacık	NA	NA	Available
Yozgat	Akdağmadeni	Alicik	Available	no	Available
Yozgat	Akdağmadeni	Halhacı	Available	no	Available
Yozgat	Akdağmadeni	Karadikmen	Available	yes	Available
Yozgat	Akdağmadeni	Dolak	Available	yes	NA
Yozgat	Akdağmadeni	Hayran	Available	no	NA
Yozgat	Akdağmadeni	Kartal	Available	no answer	NA
Yozgat	Akdağmadeni	Kuşlukaçağı	Available	yes	NA
Yozgat	Akdağmadeni	Paşabey	Available	no answer	NA
Yozgat	Akdağmadeni	Belekçalan	NA	NA	Available
Yozgat	Akdağmadeni	Kirsinkavağı	NA	NA	Available
Yozgat	Aydıncık	Kocabekiroğlu	Available	yes	NA
Yozgat	Aydıncık	Kazankaya	NA	NA	Available
Yozgat	Aydıncık	Kuşsaray	NA	NA	Available
Yozgat	Çayıralan	Evciler	Available	not known	Available
Yozgat	Çayıralan	Kaletepe	Available	no	Available
Yozgat	Çayıralan	Menteşe	Available	yes	NA
Yozgat	Çayıralan	Alidemirci	NA	NA	Available
Yozgat	Çayıralan	Günyayla	NA	NA	Available
Yozgat	Çekerek	Çandır	Available	no	Available
Yozgat	Çekerek	Bazlanbaç	Available	no answer	NA
Yozgat	Çekerek	Fuadiye	Available	yes	NA
Yozgat	Çekerek	Kayalar	Available	yes	NA
Yozgat	Çekerek	Yukarıoba	Available	no	NA
Yozgat	Kadıışehri	Gümüüşsu	Available	not known	Available
Yozgat	Kadıışehri	Buzluk	Available	yes	NA
Yozgat	Kadıışehri	Kıyılı	Available	not known	NA
Yozgat	Kadıışehri	Vasfibey	Available	not known	NA
Yozgat	Kadıışehri	Kemallı	NA	NA	Available
Yozgat	Kadıışehri	Yukarıkızılöz	NA	NA	Available
Yozgat	Merkez	Büyükmahal	Available	yes	Available
Yozgat	Merkez	Darıcı	Available	not known	NA
Yozgat	Saraykent	Sarayözü	Available	yes	Available
Yozgat	Saraykent	Kesikköprü	Available	yes	NA

Province	District	Settlement	Any historical, religious sites?	Is it under protection?	Any archeological site/protected area?
Yozgat	Saraykent	Benli	NA	NA	Available
Yozgat	Sorgun	Hoşumlu	Available	yes	Available
Yozgat	Sorgun	Tulum	Available	yes	Available
Yozgat	Sorgun	Büyükeyneli	Available	not known	NA
Yozgat	Sorgun	Araplı	NA	NA	Available
Yozgat	Sorgun	Günyazı	NA	NA	Available

Source: SESA Field Study, CLQ 2020.

There are no official records for intangible cultural heritage. According to UNESCO, intangible cultural heritage is traditions or life experiences such as oral traditions, performing arts, social practices, rituals, celebration events, knowledge and practices about nature and the universe, or knowledge and skills related to the production of traditional arts, which we inherit from our ancestor and will pass on to our future generations. As in general in Turkey there are ceremonies and cultural practices as intangible cultural heritage in the Basin such as ceremonies related to birth, death, wedding, circumcision.

As evident from the CLQ, the settlements in the CPA have a rich and diverse intangible cultural heritage. Almost every settlement reported a special food as part of their culinary culture. Amongst many others, dishes like *bat* (made with lentil and bulgur), *madımak* (made with local green plants), *hingel* (local traditional meal with meat) and Circassia dishes were also especially mentioned. The music culture was also prominent in the CPA especially due to close links between music and Alevi culture, but apart from this tradition there was also some rich examples of Turkish folk music stemming from the region. Local dances and local halay were also mentioned. Handcrafts like weaving, lace work, embroidery, carpet and rug making were also widespread in the region.

Traditional folk medicine included many remedies especially for food poisoning, skin diseases, and seeking prayers from reputed healers in the settlements seemed a common practice.

Traditional technology use was another good example of intangible cultural heritage in the CPA. Traditional flour mill, use of hand mills to grind various legumes were also mentioned by the muhtars of the settlements. Answers of the muhtars summarized in the table below.

Table 6-98 Information from mukhtars about Intangible cultural heritage

Province	District	Settlement	Oral Art	Food Culture	Music Culture	Traditional Dance	Traditional Handicraft	Traditional Clothing Outfit	Traditional Folk Medicine or Animal Health Practice	Traditional Technology
Corum	Alaca	Akçaköy	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Akpınar	Same in Turkey	Same in Turkey	Same in Turkey	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Büyükcamili	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Büyüksöğüt	Same in Turkey	Same in Turkey	halk ozanları	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Çalköy	Same in Turkey	Local pastry, Kars Local cuisine	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Çatak	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Çatalbaş	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	if the animal is poisoned, drink ayran	NA
Corum	Alaca	Çatalkaya	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Çelebibağı	Same in Turkey	Same in Turkey	People who play local instrument called bağlama	halay	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Çetederesi	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA

Corum	Alaca	Çevreli	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Çırçır	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Çopraşık	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Değirmenönü	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Gazipaşa	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Gerdekkaya	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Gökören	Same in Turkey	Circassian chicken, Circassian pastry, haluş, katmer	Circassian music	Caucasian dances	Same in Turkey	hat	oils against skin diseases	NA
Corum	Alaca	Kalınkaya	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Kargın	Same in Turkey	madımak	Folk music, saz (local instruments)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Kızılyar	Same in Turkey	Hingel	Same in Turkey	Same in Turkey	dowery	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Koyunoğlu	Same in Turkey	bulgur pilaf	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Kuyuluş	Same in Turkey	Same in Turkey	Same in Turkey	Halay (type of folk dance)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Küçükдона	n.a	no answer	no answer	no answer	no answer	no answer	no answer	no answer

Corum	Alaca	Kûlah	Same in Turkey	yayla soup, mantı, erişte	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Küre	Folk tales	Traditional green pees meal, katmer	Playing Saz (folk instrument)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Perçem	Same in Turkey	Kurban (Adha) meal, toybaşı soup	Şenlik (type of festivals in villages)	Glass crafting, semah	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey
Corum	Alaca	Tutaş	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Velet	Same in Turkey	Same in Turkey	semah	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Alaca	Yatankavak	Same in Turkey	bulamaç, madımak (local food)	Same in Turkey	Halay (folk dance)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Ortaköy	Asar	Same in Turkey	Same in Turkey	Folk music (türkü)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	hand grinder
Corum	Ortaköy	Fındıklı	NA	bulgur pilaf-Omaç (local food)	Playing local instrument (saz)	Same in Turkey	Same in Turkey	loose robe	NA	NA
Corum	Ortaköy	Salbaş	Same in Turkey	yarma, bulgur, keşkek	Folk music (türkü)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Ortaköy	Senemoğlu	Same in Turkey	Traditional bread	Folk musicians (halk ozanları)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Corum	Ortaköy	Yukarıkuyucak	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Çöte	Same in Turkey	keşkek	Traditional drum and traditional clarion (zurna)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA

Sivas	Yıldızeli	Çukursaray	Same in Turkey	Yayla soup	Same in Turkey	Same in Turkey	Handmade rug, lace, booties	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Davulalan	Same in Turkey	Kars local food	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Dikilitaş	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	not used
Sivas	Yıldızeli	Eşmebaşı	Same in Turkey	madımak	Local instruments traditional clarion (zurna), saz	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Kadıköy	Same in Turkey	Sivas mantı meal, madımak	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Kaman	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	There was a flour mill, it was closed
Sivas	Yıldızeli	Kapı	Same in Turkey	madımak, yufka (type of traditional pastry)	saz	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Ortaklar	Same in Turkey	kaynatma soup, madımak, rosehip	Almost everybody plays saz (local instrument)	Same in Turkey	cross stitch	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Subaşı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Topluyurdu	Same in Turkey	Tarhana soup, madımak	Saz (local instrument)	Same in Turkey	Same in Turkey	old ottoman dress	Same in Turkey	NA

Sivas	Yıldızeli	Yağlıdere	folk stories of Alevi culture	Same in Turkey	whirl and cem (Alevi worship)	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA yet
Sivas	Yıldızeli	Yassıkara	Same in Turkey	Special organization for feast after funerals and weddings	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA yet
Sivas	Yıldızeli	Yavu	Same in Turkey	küze, hün kam, Circassian chicken and other Circassian food	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Yaylagöze	Same in Turkey	arap aşısı	Folk musicians (halk ozanları) and playing saz	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Sivas	Yıldızeli	Yukarıkecik	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Artova	Ahmetdaniş ment	Same in Turkey	sarma	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA yet
Tokat	Artova	Bebekderesi	Same in Turkey	Food cooked on the sheet iron, çökelek, rosehip pekmez (a type of boiled heavy fruit juice) and syrup	Same in Turkey	madımak halayı	Same in Turkey	Same in Turkey	Same in Turkey	NA

Tokat	Artova	Boyunpınar	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Artova	Evlidere	Same in Turkey	traditional chicken and patoto meal	Turkish Folk Music	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Artova	Gümüşyurt	Same in Turkey	bat, yaprak, kebab	saz traditional drum (davul) traditional clarion (zurna)	Same in Turkey	no more	Same in Turkey	Same in Turkey	NA
Tokat	Artova	Gürardıç	Same in Turkey	madımak meal	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Artova	Mertekli	Same in Turkey	bat	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	We give birth to animals. we discharge the poisonous gas in poisoning	NA
Tokat	Artova	Salur	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Artova	Tuzla	Same in Turkey	Same in Turkey	Same in Turkey	ellik dance	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Artova	Yukarıgüçlü	Same in Turkey	bat meal	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Sulusaray	Balıkhisar	Same in Turkey	Bat meal, yaprak dolma	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	We give birth to animals.	NA
Tokat	Sulusaray	Belpınar	Same in Turkey	arap aşı	arabesque, türkü	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Sulusaray	Dutluca (Malum Seyit Tekke)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA

Tokat	Sulusaray	Elmalıçiftliği	Same in Turkey	Tandır bread, ekşili çorba (soup)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Sulusaray	Tekkeyeni	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Sulusaray	Uylubağı	Same in Turkey	Keşkek	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Yeşilyurt	Büget	Same in Turkey	Same in Turkey	traditional drum (davul) saz	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA
Tokat	Yeşilyurt	Çırdak	Same in Turkey	Keşkek	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	sherbet is given when the animal is poisoned	NA
Tokat	Yeşilyurt	Damlalı	Same in Turkey	kete, madımak	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Yeşilyurt	Doğlacık	Same in Turkey	Same in Turkey	Same in Turkey	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Yeşilyurt	Karacaören	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Yeşilyurt	Karaoluk	Same in Turkey	birlik kurbanı (type of adha meal), aşure	Turkish Folk Music	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Yeşilyurt	Kavunluk	Same in Turkey	Traditional Circassian food and cuisine	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Yeşilyurt	Sekücek	Same in Turkey	madımak, tarhana, wine leaf and cabbage sarma meals	Same in Turkey	cem and semah, ellik halayı	stitching	patterned dresses	cutting off part of the uterus of animals	hand grinder

Tokat	Yeşilyurt	Sivri	Same in Turkey	madımak, yaprak sarma	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Tokat	Yeşilyurt	Yağmur	Same in Turkey	Same in Turkey	Same in Turkey	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Akbaş	Same in Turkey	tahıl odaklı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Akçakoyunlu	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Alicik	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	if the animal is poisoned, drink ayran	NA
Yozgat	Akdağma deni	Belekçalan	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Boyalık	Same in Turkey	arabaşı, madımak	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Bozhüyük	Same in Turkey	madımak, güveç (type of casserole meal)	Same in Turkey	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Çağlayan	Same in Turkey	saç kavurma (type of meat meal cooked on the sheet steel)	saz	Same in Turkey	knitting socks, weaving rugs	Same in Turkey	Same in Turkey	hand grinder
Yozgat	Akdağma deni	Çerçialanı	Same in Turkey	Feasts provided by our village association	Same in Turkey	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Dereyurt	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA

Yozgat	Akdağma deni	Dolak	Same in Turkey	Same in Turkey	Same in Turkey	hospitality halay	Same in Turkey	Same in Turkey	molasses is boiled	NA
Yozgat	Akdağma deni	Evcı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Gökdere	Same in Turkey	bulgur koftas	Folk song	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Halachic	Used to have but no more	su böreği, macir somonu, casserole chick peas	Yozgat ağırlaması	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA yet
Yozgat	Akdağma deni	Hayran	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Karacaören	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Karadikmen	Same in Turkey	arabaşı	Same in Turkey	hospitality halay, bobbili halay	lacework and crafts	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Kartal	Same in Turkey	madımak, bulamaç aşı	traditional drum (davul) traditional clarion (zurna)	halay	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Kırlar	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Kirsinkavağı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Kuşlukaçağı	Same in Turkey	arabaşı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Melikli	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA

Yozgat	Akdağma deni	Oluközü	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Ortaköy	Same in Turkey	arap aşısı, madımak	türkü	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Özer	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Paşabey	Same in Turkey	haricot bean	Folk music	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Pazarcık	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Sağıroğlu	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Sarıgüney	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Üçkaraağaç	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA yet
Yozgat	Akdağma deni	Yukarıçulhalı	Same in Turkey	tandır kebab, somonlu çörek	uzun hava (special type of folk song)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Akdağma deni	Yünelanı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Aydıncık	Ağıllı	Same in Turkey	Traditional Circassian food such as haluj	Circassian music	Circassian dances	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Aydıncık	Bakırboğazi	Same in Turkey	arabaşı, Traditional Circassian food	Same in Turkey	Circassian dances	Same in Turkey	Same in Turkey	Same in Turkey	NA

Yozgat	Aydıncık	Güroğlu	Same in Turkey	Traditional lamb meat meals	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Aydıncık	Hacıilyas	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Ayran is given to the poisoned animal. If the animal's abdomen swells, it itches to prevent clotting and is washed with cold water.	Flour mill
Yozgat	Aydıncık	Kazankaya	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Aydıncık	Kocabekiroğlu	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Aydıncık	Kuşaray	Same in Turkey	Traditional Circassian food	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	If the animal is poisoned, its own milk is mixed with the soil and drunk. If the animal swallows a poisonous insect, its ear is cut off to prevent coagulation.	NA
Yozgat	Aydıncık	Kuyuköy	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Aydıncık	Mercimekören	Circassian Culture	Haluj, Şips Basta	Kafe Circassian Music, Şeşen	Circassian dances	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Aydıncık	Mollaismail	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA

Yozgat	Çayıralan	Alidemirci	Same in Turkey	arabaşı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çayıralan	Evciler	weaving	keşkek	traditional drum (davul) traditional clarion (zurna)	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA
Yozgat	Çayıralan	Günyayla	Same in Turkey	keşkek, arabaşı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çayıralan	Kaletepe	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çayıralan	Karaazap	Same in Turkey	tarhana	Traditional drums (davul) and traditional clarion (zurna)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çayıralan	Külekçi	Same in Turkey	arabaşı, sini desert	Same in Turkey	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA
Yozgat	Çayıralan	Menteşe	Same in Turkey	Green peas and tandır	Saz	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	mill
Yozgat	Çayıralan	Söbeçimen	Same in Turkey	haşıl, arabaşı, hingel	Same in Turkey	hospitality halay	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çayıralan	Yukarıtekke	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Başalan	Same in Turkey	Same in Turkey	Same in Turkey	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Bazlanbaç	Same in Turkey	arabaşı, düğün çorbası (wedding soup)	folk songs, Aşık Veysel	Same in Turkey	weaving, lacework and crafts	Same in Turkey	Same in Turkey	NA

Yozgat	Çekerek	Çandır	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Çayırözü	Same in Turkey	Traditional Circassian food, basta, traditional chicken	Use of harmonica in local music	Circassian dances	Same in Turkey	Same in Turkey	Salty ayran is drunk when the animal is poisoned or eats wild grass.	NA
Yozgat	Çekerek	Fuadiye	Same in Turkey	Circassian bastası, Traditional Circassian food	Harmonica dances	Circassian dances	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey
Yozgat	Çekerek	Gökdere	Same in Turkey	arabaşı çorbası, testi kabab	saz çalma (playing a traditional type of stringed instrument)	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Gönülyurdu	Same in Turkey	bulgur	Folk songs	Same in Turkey	knitting socks	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Hamzalı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	İkizce	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	weaving rugs	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Kayalar	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Koyunculu	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Kuruçay	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Mehmetli	Same in Turkey	madımak	Same in Turkey	hospitality halay	knitting socks	Same in Turkey	Same in Turkey	NA

Yozgat	Çekerek	Tipideresi	Same in Turkey	tandır kebab	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	not used
Yozgat	Çekerek	Yukarı Karakaya	Same in Turkey	chickpeas, madımak	türkü	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Yukarıkarah acılı	Same in Turkey	bulgur pilaf	Folk Music	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Çekerek	Yukarıoba	Same in Turkey	ayran çorbası	Folk Music	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Buzluk	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Elmalı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Gümüşsu	Same in Turkey	sarma, madımak	Same in Turkey	Same in Turkey	weaving, lacework and crafts	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Kemallı	Same in Turkey	Same in Turkey	Same in Turkey	halay	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Kıyılı	Same in Turkey	tandır	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Vasfibey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	weaving hugs	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Yanık	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Yelten	Same in Turkey	katmer	traditional drum (davul) traditional clarion (zurna)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Kadışehir	Yoncalık	Same in Turkey	Same in Turkey	synı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA

Yozgat	Kadıřehri	Yukarıkızılöz	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Merkez	Aktaş	Same in Turkey	bat, madımak, katmer	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Merkez	Büyükmahal	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Merkez	Dağyinecesi	Same in Turkey	madımak, arabaşı	saz	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Merkez	Darıcı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA yet
Yozgat	Merkez	Deremumlu	Same in Turkey	arabaşı	Traditional village games, İbrahim Bahar folk songs	halay	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Merkez	Kışlaköy	Same in Turkey	madımak	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Merkez	Kolanlı	Same in Turkey	haricot bean meal	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey
Yozgat	Saraykent	Benli	Same in Turkey	arabaşı	Same in Turkey	Same in Turkey	Same in Turkey	knit outfit	Same in Turkey	seed and bulgur sieving
Yozgat	Saraykent	Çiçekli	Same in Turkey	bulgur, tarhana	Neşet Ertaş	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Saraykent	Kamberli	Same in Turkey	madımak, arapaşı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Saraykent	Kesikköprü	Same in Turkey	Bulgur	arabesque	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA

Yozgat	Saraykent	Sarayözü	Same in Turkey	tandır kebab madımak, kavurma	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Saraykent	Söğütlü	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Sorgun	Akocak	Same in Turkey	madımak, yogurt	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	We give birth to animals	NA
Yozgat	Sorgun	Araplı	Same in Turkey	arap aşısı	türkü	Same in Turkey	lacework and crafts	Same in Turkey	Same in Turkey	Same in Turkey
Yozgat	Sorgun	Ayvalık	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Sorgun	Büyükeyneli	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Sorgun	Faraşlı	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Sorgun	Gököz	Same in Turkey	tereyağlı yemek, madımak	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Sorgun	Günpınar	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Sorgun	Günyazı	Same in Turkey	meatball meal (bulgur kofta), bulgur pilaf, yayla soup	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA
Yozgat	Sorgun	Hoşumlu	Same in Turkey	arabaşı, mihlama, meatball meal (bulgur kofta)	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	NA

Yozgat	Sorgun	Küçükeyneli	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	Same in Turkey	used to have but not anymore
Yozgat	Sorgun	Tulum	poets, Folk Musician (Halk Ozan)	bulgur, bulamaç, musket meatballs	aşıklar and ozanlar village poetry	whirl and cem (Alevi worship)	Same in Turkey	Same in Turkey	The traditional practice of continually weakening a newborn child.	NA

Source: SESA Field Study, CLQ 2020.

## 7. IDENTIFICATION of KEY E&S ISSUES

The SESA focuses on key environmental and socio-economic issues directly related to Project Area. These issues were initially stipulated in the Scoping Report from stakeholder concerns as well as observations during the field visits and initial data collected. This chapter will make use of assessment of the baseline in order to verify and prioritize the key issues identified at the scoping stage.

In this chapter, the key issues identified in the scoping report are revisited with a view to analyzing drivers and priorities in the light of updated information. Thereby, a series of thematic studies have been performed to verify the issues raised at local level by communities and representative of provincial and district-level authorities.

Identification of key issues is based on analytical work using GIS analysis, case studies and participatory rural appraisal methods. GIS analyses are performed by mapping and overlaying different sets of data to identify critical areas of concentration of environmental and social issues. Case studies are used in order to understand inter-sectoral linkages. Results of stakeholder surveys are used as a participatory rural appraisal tool at the community level.

### 7.1. Key Environmental Issues

When the characteristics of the Çekerek Project Area are evaluated, some environmental key issues that should be considered in the implementation of the sub-projects within the scope of TULIP have been identified as summarized in Table 7-1. Grey rows indicate issues with significance that require further assessment of linkages with current environmental problems in the project area.

**Table 7-1 Key Environmental Issues**

Issues/Sensitivities	Description	Validation and Assessment Tools
<b>Drought</b>	Qualitative research shows that the basin has high exposure to drought hazard. This exposure is higher in the northern areas of the basin.	A Meteorological Drought Assessment Report published in 2018 demonstrated that Turkey experienced meteorological droughts in various regions. Large areas within the Çekerek Basin presents a SPI (Standardized Precipitation Index) that characterizes the region by being either 'severely dry' or 'moderately dry'. The importance of drought exposure in the region has been confirmed by stakeholders from OGM and DSI.
<b>Floods</b>	Flood events are very rare in the CPA. On the other hand, heavy floods which cause some casualties are observed in the CPA. The two provinces, Tokat and Yozgat faced with one and two flooding	Meteorology Reports Flood Risk/Incidence Maps

Issues/Sensitivities	Description	Validation and Assessment Tools
	<p>events respectively in 2018. More recently there were reports of flooding in June 2019 in the east of the basin in Yıldızeli District. A significant rainfall event led to localised flooding, impacting residential and industrial properties.</p>	
<b>Erosion</b>	<p>Semi arid climate, morphology of stream beds and low vegetation cover are the major cause of the water erosion.</p> <p>The average erosion rate of the basin is 18 tons/ha/year, which is considerably higher than the average value in Turkey.</p> <p>Dry agriculture is practised intensely in the region, which increases soil erosion.</p>	<p>Erosion Map Stakeholder Consultations</p>
<b>Landslides</b>	<p>There are few active landslide zones in the basin and most of them are concentrated in the north of the basin. The most recent landslide in the study area occurred in Çorum Province in Akkent Neighbourhood in March 2021. Due to the landslide, 3 buildings were evacuated. The low exposure to landslides hazard in the study area can be attributed to the arid and sub-arid climate of the basin.</p>	<p>Stakeholder consultations Landslide Map</p>
<b>Insufficient Water Supply for Domestic Use and Irrigation</b>	<p>Main source of drinking water supply is groundwater in the CPA; surface water (reservoirs) is mostly used for irrigation.</p> <p>There is a potential risk in terms of groundwater depletion at Alaca sub basin. Industrial water use together with agricultural irrigation are the main cause of depletion problem.</p> <p>In Çekerek sub-basin, at present, pressure on groundwater is low compared to Alaca sub basin. On the other hand, increase in agricultural activities is expected to put stress on groundwater resources.</p>	<p>Groundwater monitoring results in terms of level and quality parameters.</p> <p>Stakeholder consultations Literature review</p>
<b>Surface water pollution</b>	<p>In general surface water pollution level in the CPA is low. Major surface water pollution problem is observed at Alaca Stream caused by industrial and domestic wastewater discharges from Çorum Provincial center. On the other hand, lack of sewerage network and septic tanks used in rural areas, direct discharge of wastewater into creeks, solid waste dumps to water resources are potential water pollution sources.</p>	<p>Water quality records, health records, location map for surface water resources.</p>

Issues/Sensitivities	Description	Validation and Assessment Tools
<b>Regional Soil Contamination</b>	Improper and unessential use of fertilizers and pesticides for agricultural activities. Waste from livestock grazing may cause soil and groundwater contamination.	Soil quality records Groundwater quality records
<b>Biodiversity</b>	Rare threatened and endangered species/ indicator species, special protection areas and legally protected areas are found in CPA.	Check and assess habitat maps, site assessments.

### 7.1.1. Drought, Soil Erosion and Agriculture

As it is given in terms of baselines conditions in Chapter 6, soil erosion is the major natural hazard potential in the CPA. Semi arid characteristic together with weak vegetation coverage (specially at steep slope sections) poses potential risk for soil erosion.

Drought conditions and dry agriculture aggravate level of soil erosion. Figure 7-1 shows map of the CPA comprised of three different information layers: irrigated and non-irrigated areas, areas with irrigation infrastructure, and crop pattern. As the figure shows, DSI has established irrigation networks at drought-prone areas with insufficient water. However, despite the irrigation systems in place, part of the land is not irrigated and the crop pattern is comprised of wheat mainly. This is indicative of the fact that farmers have not adapted to the irrigated agriculture, which underlines the importance of agricultural extension services, demonstration farms, farmers trainings.

The Kabalı village has an orchard developed over 500 hectares in Kadışehri district of Yozgat in 2019. The orchard is irrigated by means of drip irrigation system. The success in Kabalı is rooted in farmers awareness programmes and a series of trainings, marketing supports, grants and subsidies. However, despite the accessibility to irrigation systems, the surrounding farms continue with dry agriculture, not making use of the irrigation systems.

This shows that, without farmers awareness and training and financial support for on-farm systems, irrigation system investments failed to achieve goals set for water supply and diversified agriculture in the basin in general.

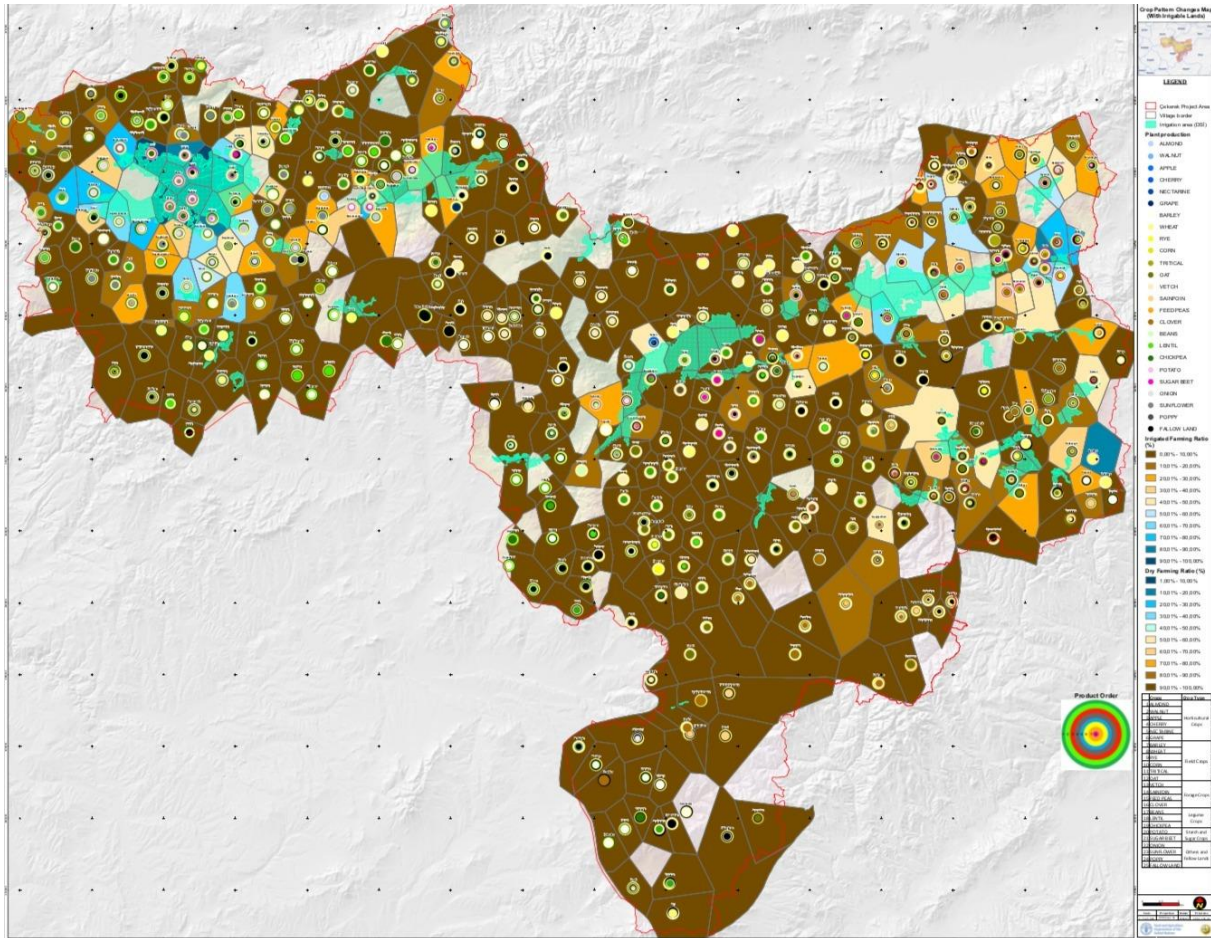


Figure 7-1 Crop Pattern and Irrigated/Dry Agriculture Areas

[Access Link](#)

### 7.1.2. Landslides and Floods

As stated in the Report entitled “Disaster and Climate Risk Assessment of the Bolaman and Çekerek Basins” (AECOM, 2021) landslides are very rarely seen in the basin. There are few active landslide zones in the basin and most of them are concentrated in the north of the basin. For instance, the most recent landslide in the study area occurred in Çorum Province in Akkent Neighbourhood in March 2021. Due to the landslide, 3 buildings were evacuated. The low exposure to landslides hazard in the study area can be attributed to the arid and sub-arid climate of the basin.

Flood events are also very rare in the CPA. On the other hand, heavy floods which cause some casualties are observed in the CPA. Fluvial flood hazard exposure is particularly pronounced along the Çekerek River in the east of the basin as the river flows through the Yesilyurt and Sulusaray Districts and further downstream until the river reaches Çekerek with large areas that have 1-in-10-year event flood hazard exposure. The tributaries of Çekerek Basin in the east, such as the Akdağmadeni Creek and Şeyhalil Stream both have significant flood hazard exposure as well as areas near Yangi. Throughout Alaca District, but particularly those in close proximity to the urban area of Alaca, have extensive areas of 1-in-10-year event flood hazard

exposure, including along Buyukoz Stream both upstream and downstream of the dam at Koçhisar. Pluvial flood hazard exposure follows a similar pattern to fluvial flood hazard exposure with particular hotspots in Alaca District and along the Çekerek River upstream of Çekerek and along the tributaries in the higher altitude areas of the east. Key areas for composite flood hazard are in the Alaca along the Buyukoz Stream, along the Cekerrek River through Aydıncık District, and the districts upstream of Cekerrek along the Çekerek River, with large areas in close proximity to those waterways highly exposed to flood hazard.

### 7.1.3. Insufficient Groundwater Supply

Strategic Assessment Report for Yeşilirmak Basin Management presents the groundwater quantity mapping, where a major part of Çekerek Project Area can be seen in Figure 7-3 below. As seen in the figure, groundwater quantity is at risk mainly in Çorum province. The Strategic Assessment Report relates the bad status of groundwater quantity to overexploitation and incorrect irrigation and farming techniques.

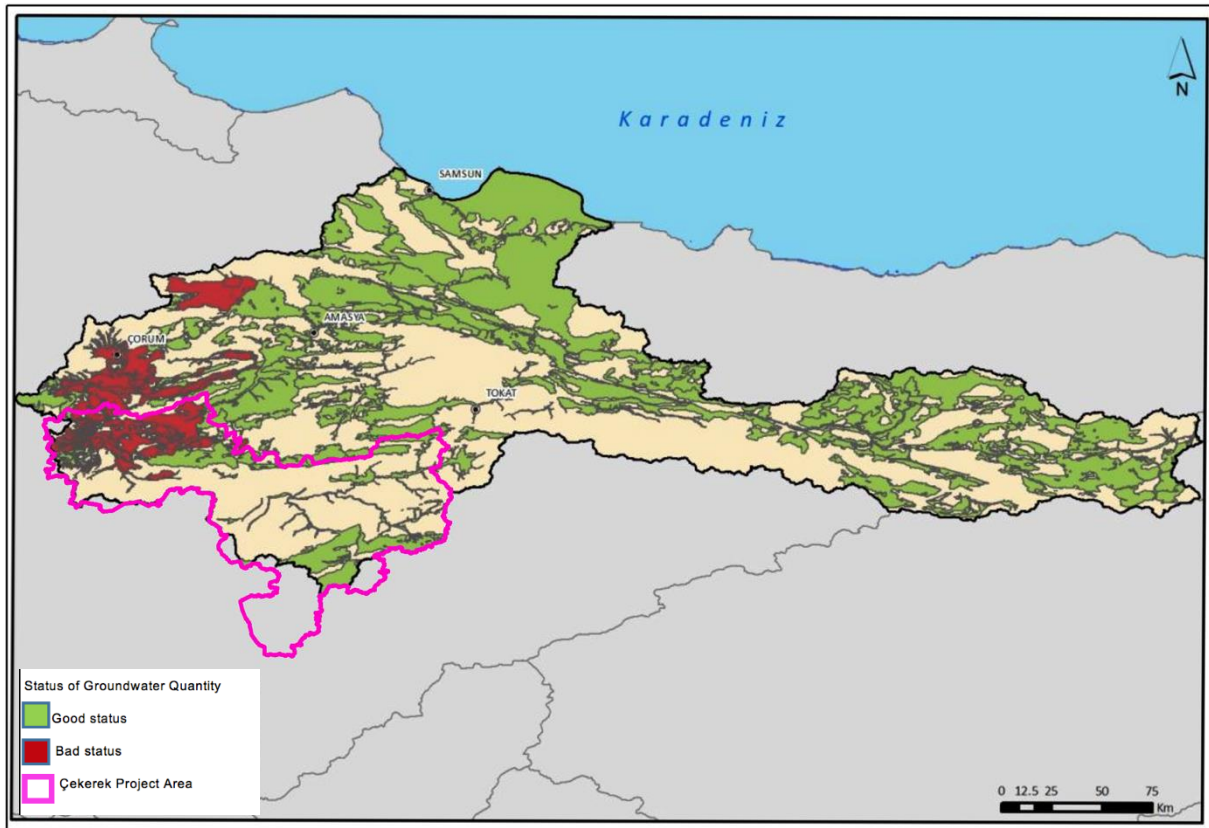


Figure 7-2 Quantity of Groundwater in Yeşilirmak Basin and CPA

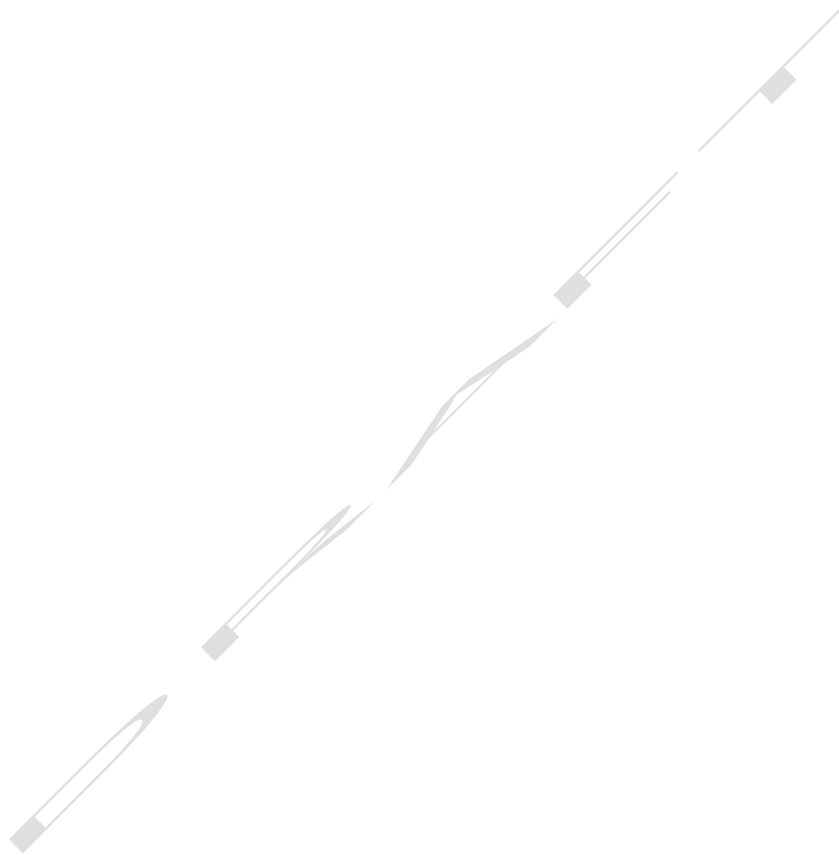
### 7.1.4. Surface Water Pollution

Surface water quality information is presented in Section 6.1.13 and surface water quality classes can be seen in Figure 6-22. As seen from the baseline information, surface water quality is mostly good in CPA except for Büyüközü Creek and Köy Creek. Surface water quality

generally results from direct discharges of urban and rural wastewater directly into the creeks, as well as surface flow of fertilizers and pesticides from agricultural fields.

#### 7.1.5. Regional Soil Contamination

There is no information on regional soil contamination at CPA. On the other hand, results of surface and groundwater quality studies indicate that there is a soil contamination potential due to improper and unnecessary use of fertilizers and pesticides. Agricultural fields located Alaca Sub-basin as well as agricultural fields located plain sections of Çekerek Sub-basin are the potential soil contamination areas. Wild dumps are another source of soil contamination in the region, but there is no available information on level of soil pollution that can be linked to these dump sites.



### 7.1.6. Biodiversity

Information on known habitats with protection status are given in above in Section 6.1.14. As referred under the respective section, overlapping of sub-projects should be checked against the areas and species of conservation importance in order to determine whether the project area is located within or near them. The overall CPA includes several natural habitats and some of them are modified by overgrazing, agricultural activities, afforestation and pollution. Ass ESS 6 notes, differentiating modified habitat from natural habitat may call for expert judgment as to whether the character and functions of the habitat remain essentially natural. With the precautionary approach, where project screening and scoping indicate that there is good reason to believe that important biodiversity features may be present and could be adversely affected by project activities, expert opinions and/or in-field biodiversity surveys are necessary to confirm absence of critical or endangered species.

## 7.2. Key Social and Economic Issues

When the characteristics of the Çekerek Project Area are evaluated, some social and economic key issues that should be considered in the implementation of the sub-projects within the scope of TULIP have been identified as summarized in the Table 7-2. Please see Chapter 8 for key gender issues.

**Table 7-2 Key Socio-Economic Issues**

Issues/Sensitivities	Description	Validation and Assessment Tools
Population sustainability	There is a large number of elderly population and return migration of people after their retirement. This makes the area a unit of consumption, not a production. This situation is potentially problematic in terms of the sustainability of agricultural activities.	Stakeholder consultations, field study and population data
Inefficiency of basic livelihoods and need for diversity due to lack of water	The main livelihood is agriculture and animal husbandry. However, there are natural problems such as a water shortage and drought that make agricultural activity difficult. Therefore, farmers need government support. Diversification of livelihoods is also a need.	Stakeholder consultations, field study and main livelihood data
Insufficient infrastructure, communication and social facilities	The lack of infrastructure and communication (telephone, internet) and social facilities trigger migration to big cities, making the region undesirable, especially for parents and young people.	Stakeholder consultations, field study and literature review
Low SES in the Basin, especially in forest communities	SES of the people in the CPA clearly demonstrated that the population of the CPA is significantly poor compared with many other regions in Turkey. What is more striking is that when earnings of the forest communities in the CPA taken into account the annual income per household in these communities is even lower.	Stakeholder consultations, field study, literature review and SES data
Insufficient Pastures and Challenges of Livestock Grazing	Grass yield of pastures in the Project area is very limited. Most of them have weak status for grazing.	Stakeholder consultation, field study and agricultural data
Vulnerable communities	The proportion of vulnerable groups that are more likely to be adversely affected by the projects and	Stakeholder consultation, literature review and official data

	who are at risk of not benefiting from the project makes the significant part of the population.	
Critical cultural areas	There are many cultural assets in the region that need to be protected from the project impact.	Stakeholder consultation, literature review and official data
Disadvantaged Rural Women	In rural areas, women cannot benefit from agricultural extension services on an equal basis with male farmers, as is the case with many other opportunities.	Stakeholder consultations, field study and literature review

### 7.2.1. Population sustainability

Two types of population change characteristics are common in the Çekerek Project Area. Accordingly, the settlements either emigrate for economic reasons or the population remains constant and does not change due to the lack young population who are tend to migrate more and retirees returning to their villages. This trend moves the age distribution in rural areas to a point that is not sustainable in terms of agricultural activity. Villages cease to be food production areas that feed cities and instead due to low expense become quiet living spaces where retirees spend time on pensions. According to the information received from muhtars, the population is decreasing due to following reasons:

- economic reasons
- lack of water and drought
- insufficiencies in infrastructure and social
- deaths

There were also a few representatives of settlements stating that the population has increased and they provided the following reasons:

- post-retirement returns to villages when rural people retire from their jobs at urban areas
- returns to villages due to economic difficulties (low and unreliable earnings) in the urban areas
- increase with birth
- returns to villages because living conditions in the village improved
- returns for living in nature

As a result of the survey studies, the population changes of some villages are presented in the map below.

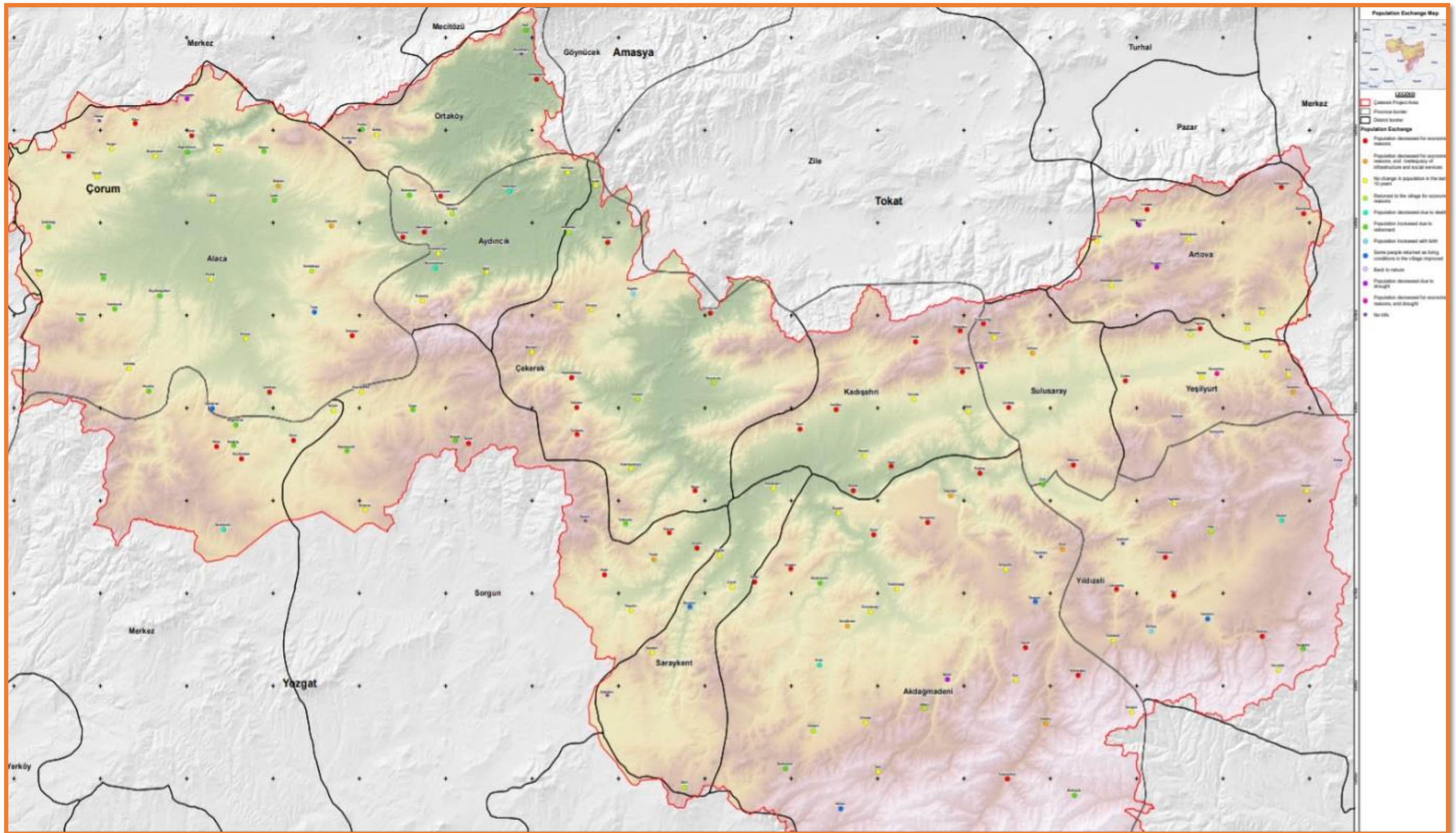


Figure 7-3 Population Changes of Some Villages [Access Link](#)

The limited and inefficient livelihoods have an effect that pushes the young population away. For this reason, diversification of livelihoods provides sustainability in terms of planned projects as they aim to form a more stable structure of the population.

### **7.2.2. Inefficiency of basic livelihoods and need for diversity due to lack of water**

In CPA, where agriculture and animal husbandry are the main sources of income, the development of water resources is one of the main demands. However, diversification of livelihoods in the geography should also be considered as an option. The diversity of livelihoods in the project area is presented on the map.



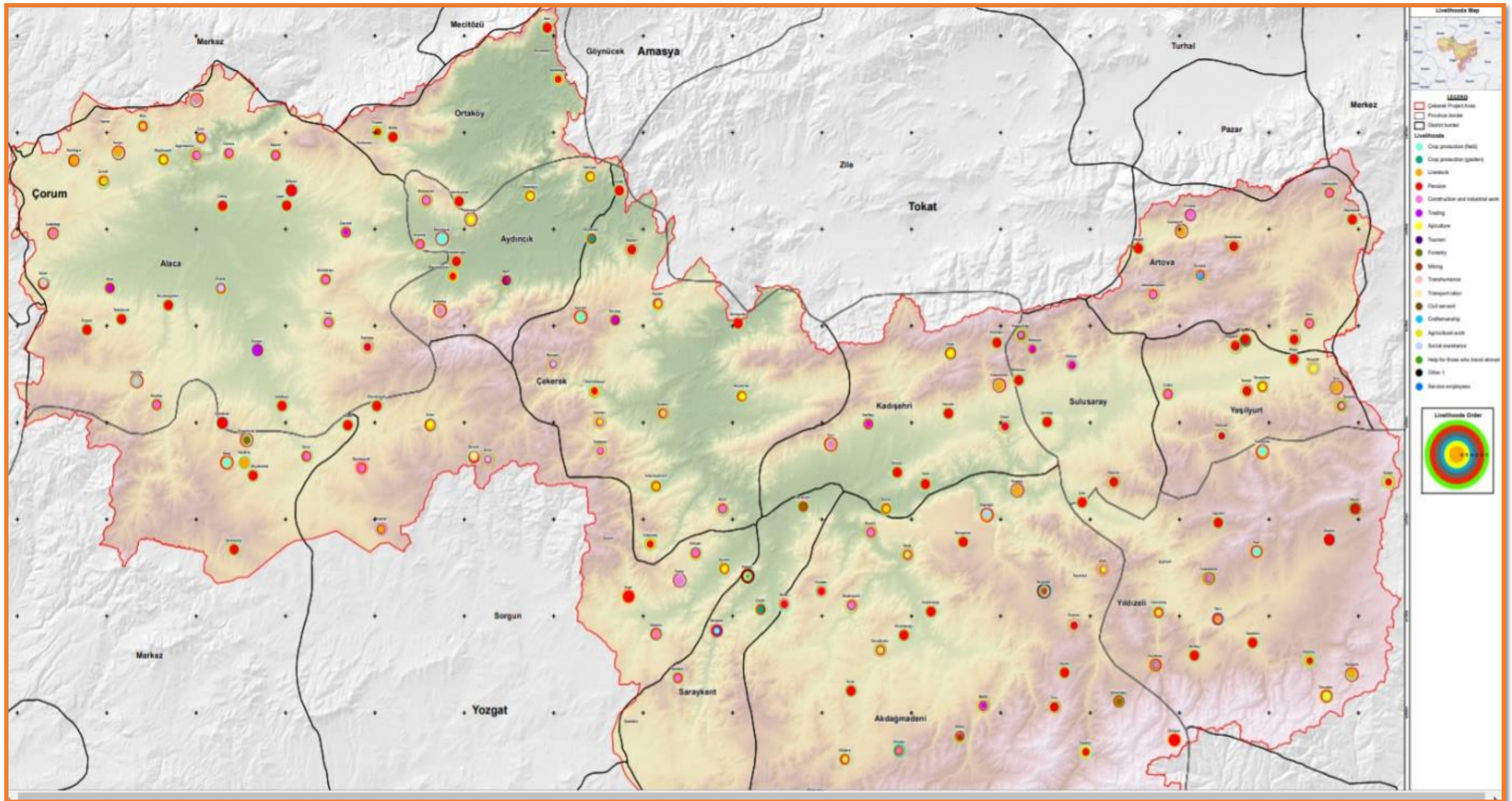
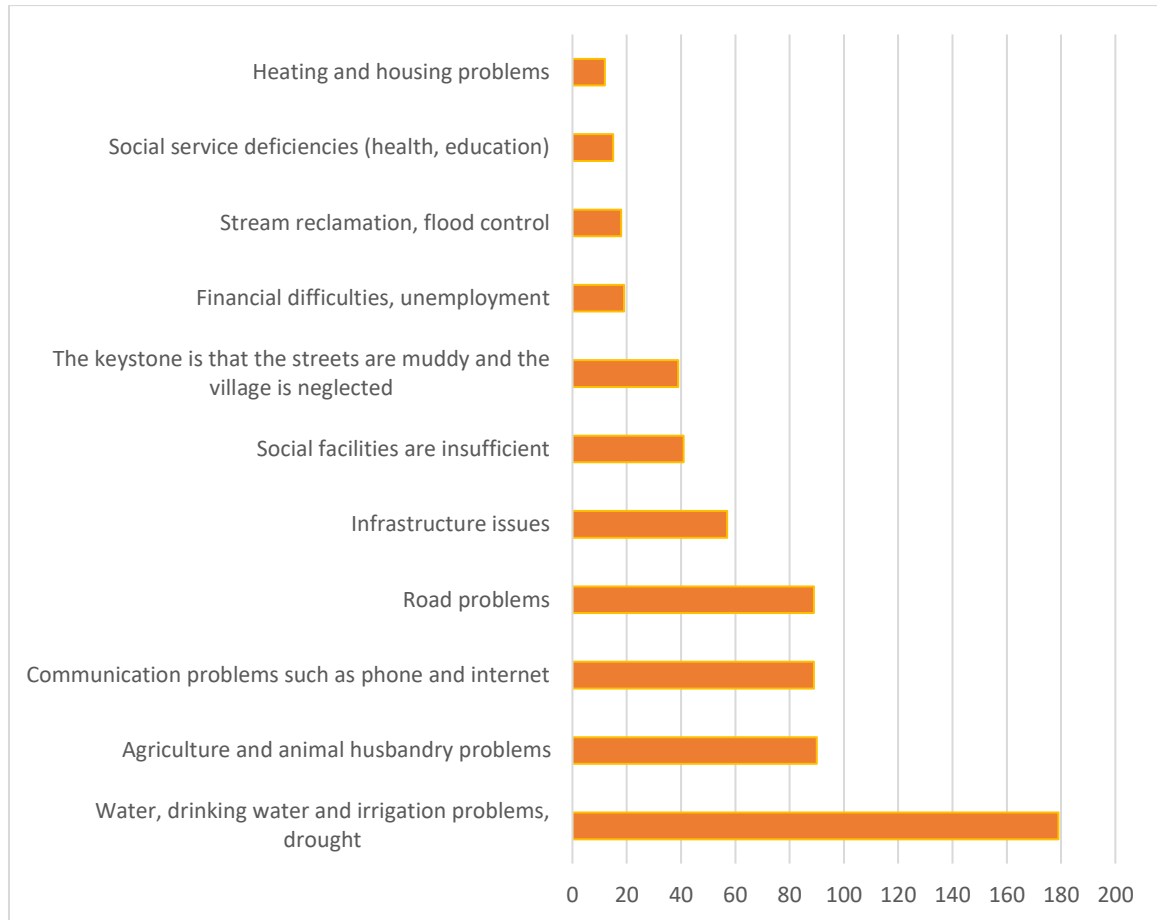


Figure 7-4 Sources of Livelihood Map [Access Link](#)

A continuous and effective drought management strategy should become a part of all policies and should be considered within the scope of TULIP as a priority issue.

### 7.2.3. Insufficient infrastructure and social facilities

When a participatory understanding is adopted, the most important problems according to the representatives of the settlements are presented in the graphic below. These are the conditions that prevent the population from living in the region and cause migration. One of the most common problems is lack of water. It is seen that related agricultural problems are followed by the need for infrastructure and communication technologies.



**Figure 7-5 Main Problems of Affected Settlements**

Source:CLQ survey sample (September, 2020)

The three most important problems of the settlements have been expressed by the muhtars are mapped and they are as follow.

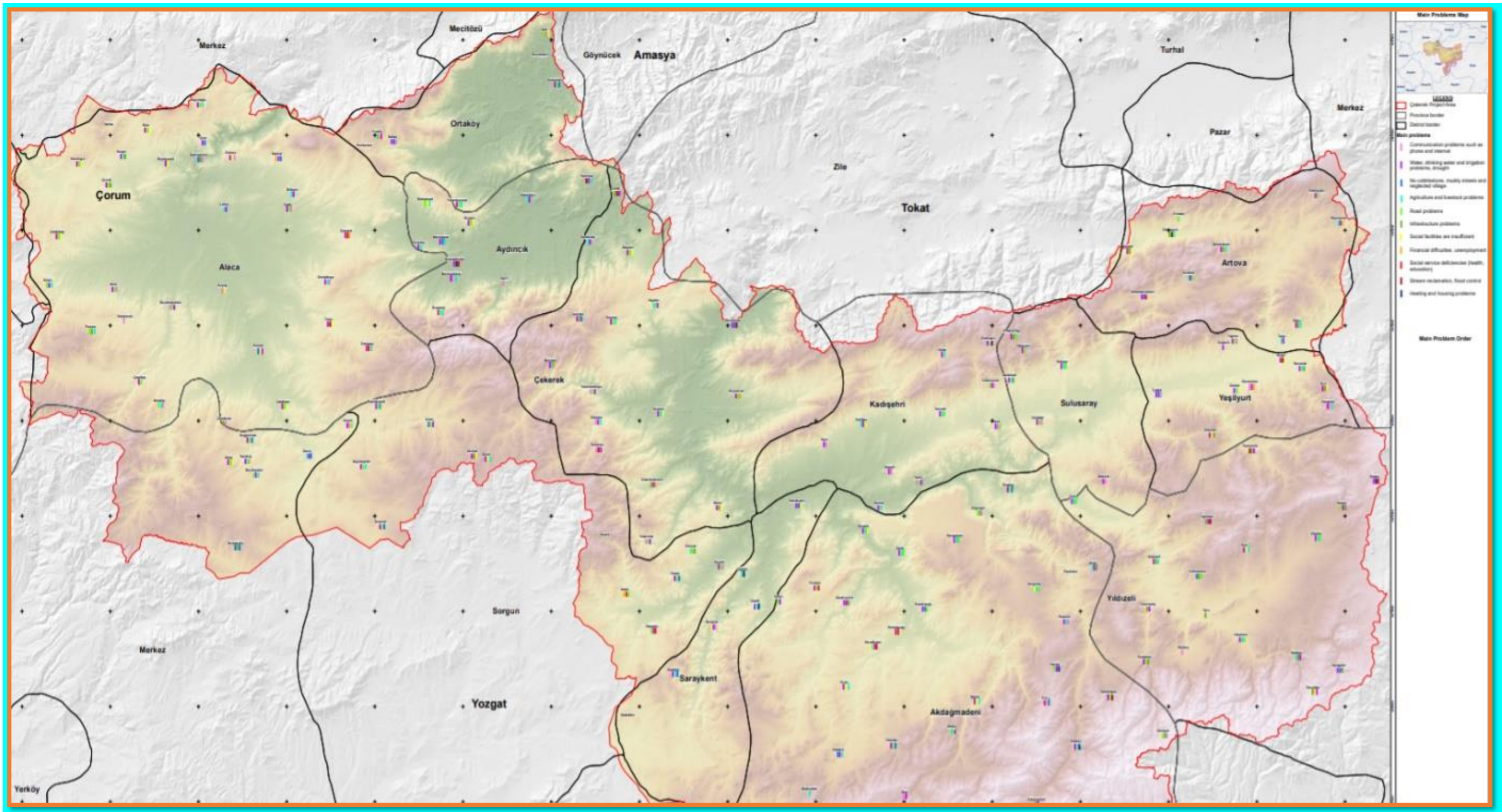


Figure 7-6 Main Problems of Çekerek Project Area [Access Link](#)

#### 7.2.4. Low SES in CPA, especially in forest communities

According to all the different indicators used to assess SES of the people in the Çekerek Project Area clearly demonstrated that the population of the area is significantly poor compared with many other regions in Turkey. What is more striking is that when earnings of the forest communities in the Basin taken into account the self-evaluation of the income level indicates that income per household in these communities is even lower. The distribution of forest communities is presented below.



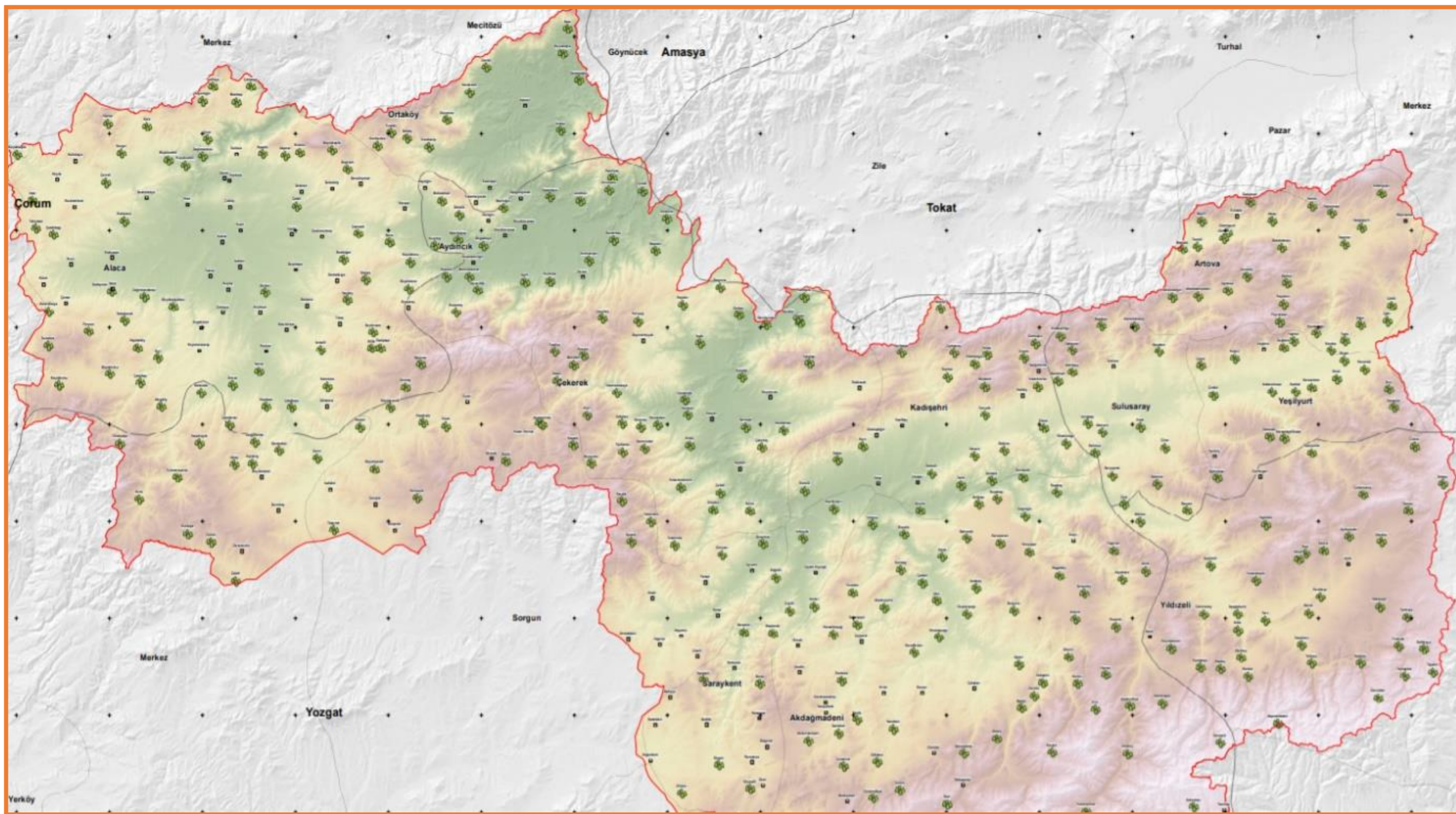


Figure 7-7 Distribution of Forest Communities [Access Link](#)

### 7.2.5. Insufficient Pastures and Challenges of Livestock Grazing

The distribution of pasture assets and its status in the CPA were mapped in Figure 7-8 below according to the TRGM records. It is clearly seen that most of the pastures have limited grazing capacity for livestock breeding. Furthermore, pasture areas in the basin are generally formed on sloping lands with thin soil structure. Despite such disadvantages that limit grazing capacity, livestock husbandry is very common in the region and according to the HHQ, pastures of the villages are a main source of livestock feeding with 63%. This contrast over the source of feed and livestock brings with it economic challenges such as nutritional efficiency and sustainability of livestock grazing in the region.

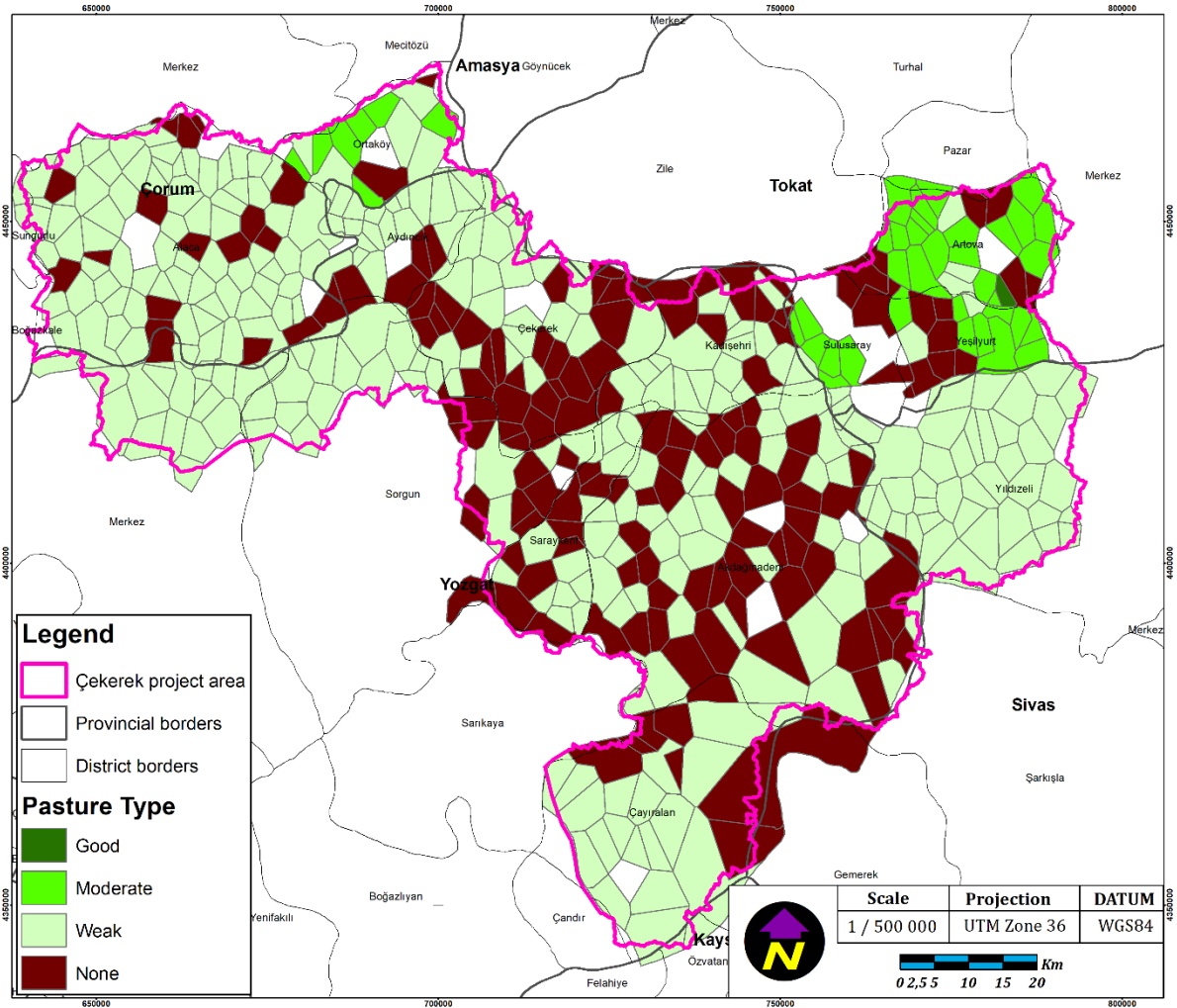


Figure 7-8 Distribution of Pasturelands

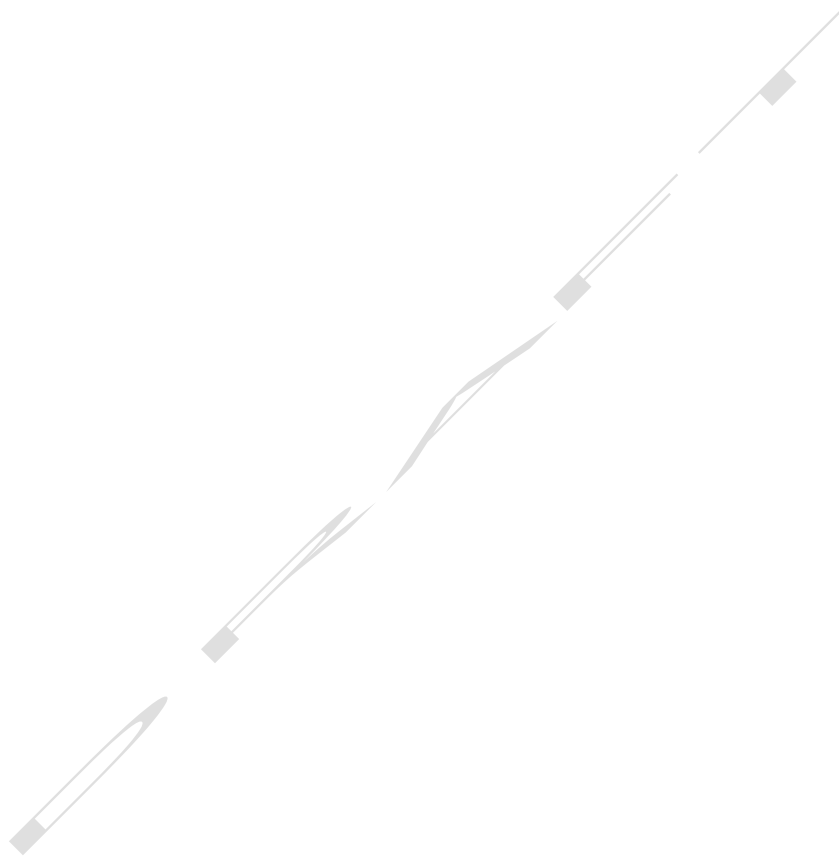
[Access Link](#)

Source: TRGM, 2019

### 7.2.6. Vulnerable Communities

The proportion of vulnerable groups that are more likely to be adversely affected by the projects and who are at risk of not benefiting from the project makes the significant part of the population. In the SESA field study which was conducted in the Çekerek Project Area, it was determined that there are many people with poor health conditions, disabilities, individuals in need of care and support, women living alone, poor people without land and animal ownership,

and there are villages with people from different ethnic backgrounds and sects in the region. The places where these people live are shown in the map below and considering the similarities of the settlements located in the region it is assumed that there is a similar trend in the settlements outside the sample group. Information on number of individuals and settlements as related with vulnerability indicators can be seen in Table 6-90.



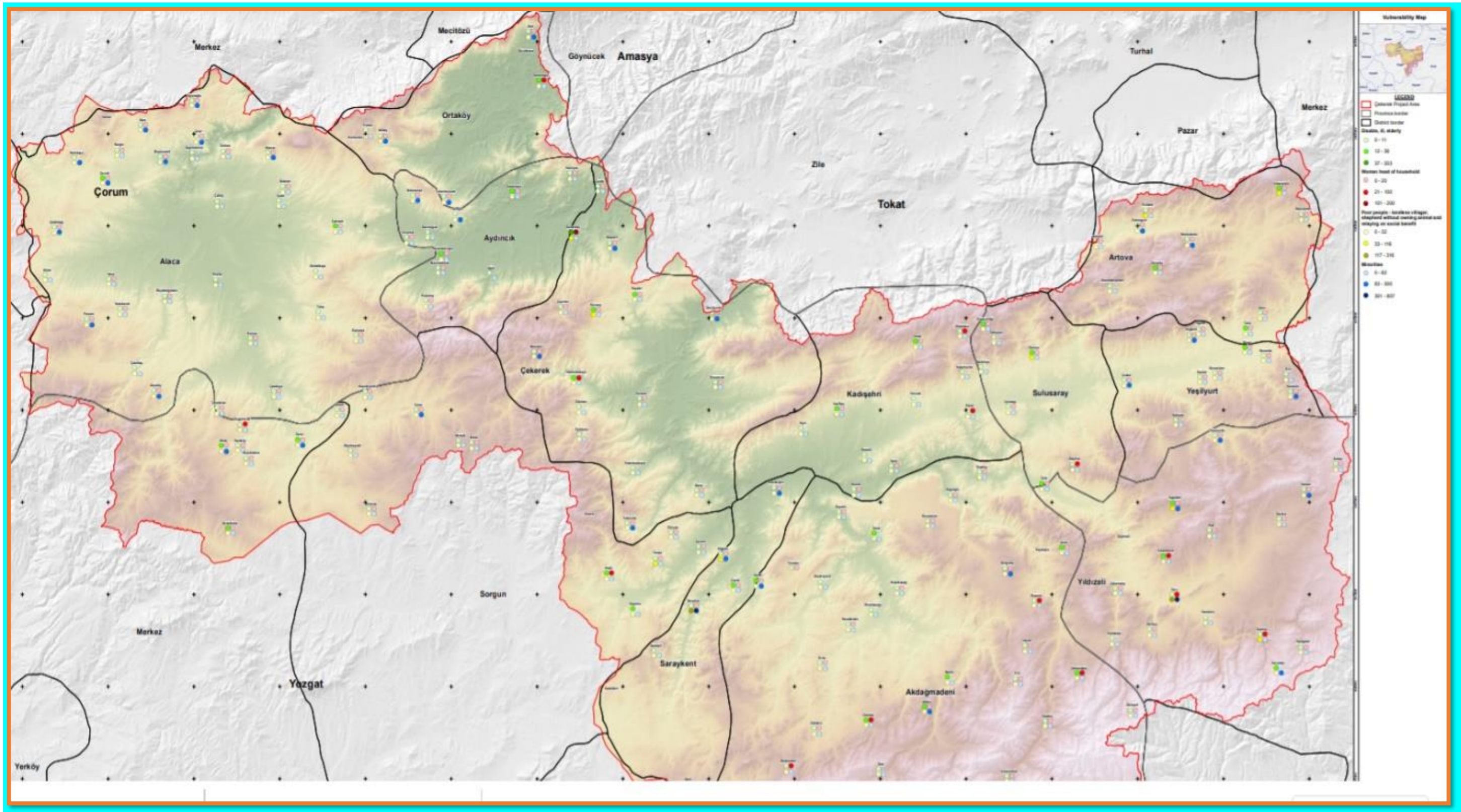


Figure 7-9 Vulnerable Groups Map [Access Link](#)

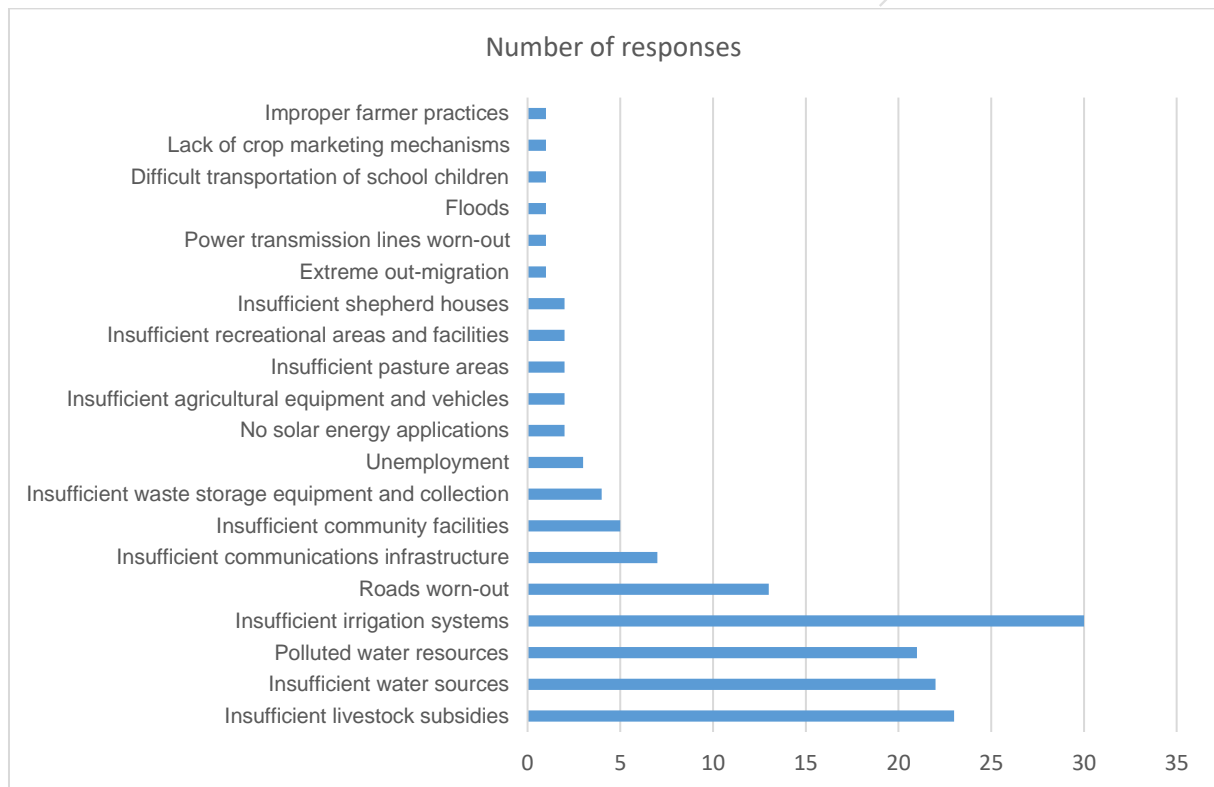
### 7.2.7. Critical Cultural Areas

There are many cultural assets (See Section 6.3) in the region that need to be protected from the project impact. These areas should be protected from both the impact of projects and construction activities. Cultural heritage records under the CPA are listed in Annex 8.

### 7.3. Prioritization of the Key E&S Issues

Prioritization of E&S issues in the project area is based on a participatory approach by performing consultations with local-level stakeholder organizations during the field visit and conducting muhtar surveys.

Muhtars in the CPA were asked about the three most important problems and needs of their villages. Responses were received from 68 muhtars. Context and number of responses can be seen in Figure 7-10 below.



**Figure 7-10 Key E&S Issues in CPA According to Muhtars**

Source: CLQ survey sample (September, 2020)

Opinions of muhtars are highly consistent with results of consultations with local stakeholders. Priority issues as stated by the muhtars are categorized and summarized below:

#### **Livestock breeding**

- Decreased livestock breeding
- Insufficient state subsidies for forage crop
- Insufficient pasturelands
- Limited access roads to pasturelands
- The barns are old
- No milk collection centers in the villages.
- Pasture improvement needs (both for feeding animals and prevent erosion)
- Existing pasturelands are weak.
- Insufficient water for livestock breeding and beekeeping activities

### **Irrigation**

- Insufficient irrigation of agricultural lands
- Irrigation shortage (water loses due to soil channel)
- Decreased water flow in streams used for irrigation

### **Agriculture**

- Supports needed for development of greenhouses and local products
- Insufficient facilities for storage of agri-products

### **Water Scarcity**

- The precipitation regime of the region has changed within the years
- Decreased groundwater resources
- Drought and drinking water shortage
- Water shortages due to population increase during holiday periods and summer months

### **Polluted surface water resources**

- Polluted water resources due to discharge of untreated wastewater
- Infrastructure deficiencies as increased by high number of seasonal workers
- Insufficient sewerage system (sewage is discharged into creeks)

### **Other issues**

- Insufficient health services
- Insufficient social facilities
- Existing roads are badly worn

Another source of information for ranking of key environmental issues is the annual report of MoEUCC. The most recently published report is dated 2021 and compiles data from 2019. According to the ranking performed at province level, the report indicates factors causing major environmental issues and provides a prioritization based on data from provincial directorates. Highlights are retrieved from the report below. It should be considered that the data are inclusive of both urban and rural domains in the 4 provinces of the CPA.

Factors for Air Pollution:

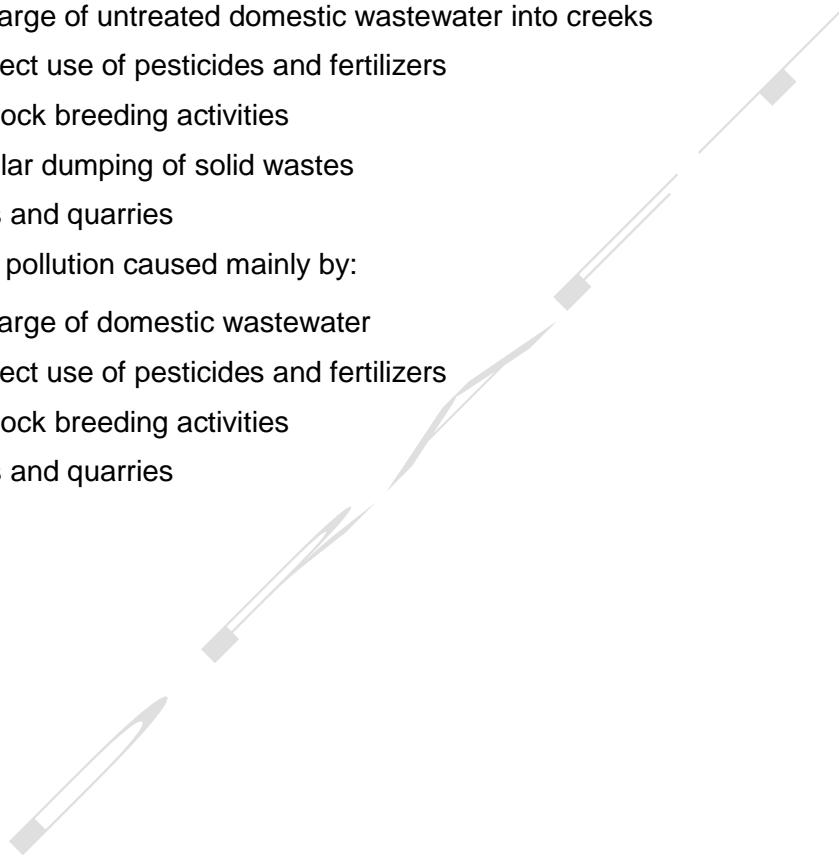
- Domestic heating
- Manufacturing industry
- Mining facilities
- Thermal power plants
- Other industrial facilities
- Highway traffic
- Construction works
- Stubble burning

Surface water pollution caused mainly by:

- Discharge of untreated domestic wastewater into creeks
- Incorrect use of pesticides and fertilizers
- Livestock breeding activities
- Irregular dumping of solid wastes
- Mines and quarries

Groundwater pollution caused mainly by:

- Discharge of domestic wastewater
- Incorrect use of pesticides and fertilizers
- Livestock breeding activities
- Mines and quarries



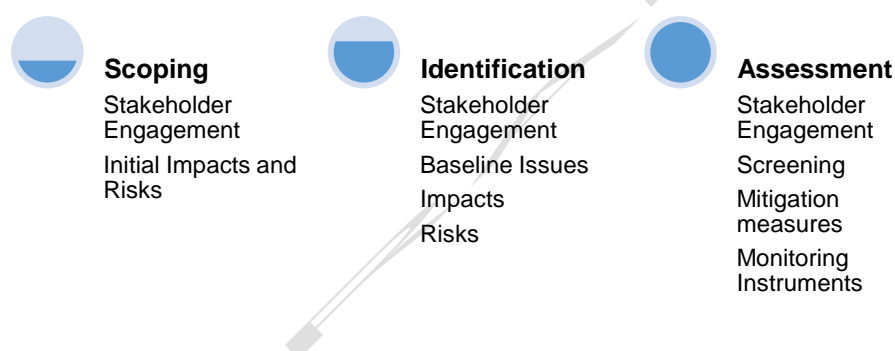
## 8. GENDER ANALYSES

### 8.1. About Gender Assessment in the TULIP Project

The overall objective of the gender assessment study is to mainstream gender issues into the SESA process and ensure the implementation of gender-responsive scoping, identification, assessment, and evaluation stages of the TULIP. Specific objectives of the gender analysis are as follows:

- 1) To collect existing and baseline gender-disaggregated information relevant to the scope of the SESA.
- 2) To identify the types of gender-related environmental and social impacts, risks, and mitigation measures.
- 3) To map key women stakeholders and ensure women's involvement in stakeholder analysis in the Project Area. Analyze women community members, including the most vulnerable ones and female-led institutions' interests, concerns, and incentives, and ensure that their opinions are taken into account in the SESA.

Gender equality assessment were embedded into three stages of the SESA study.



**Figure 8-1 Holistic Based Gender Assessment Entry Points**

The scoping phase allows for an initial understanding of potential risks and impacts that are typical for the type of sub-projects, location, and context. Scoping plays several roles concerning inequalities that arise due to gender norms<sup>29</sup>. The scoping was carried out with substantial stakeholder inputs. The stakeholder analysis intended to identify the main stakeholder groups in the basin, including local communities and vulnerable and marginalized groups.

Scoping identifies relevant project issues and affected stakeholders, including female stakeholders. Potential barriers such as attitudes, norms, communication limitations, legal restrictions, or physical barriers that may result in the exclusion of women and girls were identified during the scoping process.

<sup>29</sup> Source: The World Bank Good Practice Note Gender

Based on the results obtained through the scoping period, key gender-related impacts, both positive and negative, as well as risks, were identified to inform the selection of gender priorities. To identify key gender issues and risks, a methodology was developed. Key gender issues were assessed and prioritized via reviewing existing data, desktop studies, and also field studies.

Assessment of the gender characteristics regarding prioritized issues were made through gender mapping method and gender analysis. Mapping of existing data such as social services, education situation, sex-disaggregated data supported the assessment section. Assessment included the impacts of the sub-projects on gender issues, including women's vulnerabilities. The processes and procedures for the detailed consideration of the impacts are being developed by the Environmental and Social Management Framework (ESMF).

Sound mitigation measures were identified during the assessment phase and can result in an inclusive access, and also raise awareness of stakeholders on gender gaps and the accommodating needs of vulnerable groups.

### 8.1.1. Gender and Environmental and Social Standards

Gender issues are clearly defined in the Environmental and Social Standards (ESSs) of the World Bank. The below information presents the relevant requirements under each standard, with the focus on ESS1, 2, 4, 5, and 10, where gender equality and inclusion play a key role.

**Table 8-1 Gender and the ESS<sup>30</sup>**

<b>ESS1: Assessment and Management of Environmental and Social Risks and Impacts</b>	<ul style="list-style-type: none"> <li>• Threats to Human Security through the escalation of personal, communal, or inter-state conflict, crime, or violence (para 28).</li> <li>• Assess risks and impacts that project impacts fall disproportionately on the disadvantaged or vulnerable (which include inequalities between males and females) and any prejudice or discrimination toward such groups in providing access to development resources and project benefits (para 28).</li> <li>• Ensure that projects do not inadvertently compromise existing legitimate rights for land and natural resource tenure and use (including collective rights, subsidiary rights, and the rights of women) or have other unintended consequences, particularly where the project supports land titling and related issues (footnote 29).</li> <li>• Implement differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable. They are not disadvantaged in sharing any development benefits and opportunities resulting from the project (para 29).</li> </ul>
<b>ESS2: Labor and Working Conditions</b>	<ul style="list-style-type: none"> <li>• Specific measures against gender based violence will be taken through labor management procedures including grievance mechanism. (Unofficial statement)</li> </ul>
<b>ESS4: Community Health and Safety</b>	<ul style="list-style-type: none"> <li>• Evaluate and address the risks and impacts of the project on the health and safety of the affected communities during the project life-cycle, including the vulnerable (para 5).</li> <li>• Avoid or minimize the potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases, and</li> </ul>

<sup>30</sup> Source: WB Good Practice Note, 2019

	<p>communicable and non-communicable diseases that could result from project activities, considering differentiated exposure to and higher sensitivity of vulnerable groups (para 15).</p> <ul style="list-style-type: none"> <li>• Applying the concept of universal access in environmental design may increase women's safety and security (para 7 and 9).</li> </ul>
<b>ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement</b>	<ul style="list-style-type: none"> <li>• Ensure in the consultation process that women's perspectives are obtained, and their interests factored into all aspects of resettlement planning and implementation. Addressing livelihood impacts may require intra-household analysis in cases where women's and men's livelihoods are affected differently. Women's and men's preferences in terms of compensation mechanisms, such as replacement land or alternative access to natural resources rather than in cash, should be explored (ESS5 para 18).</li> <li>• Documentation of ownership or occupancy and compensation payments in the names of both spouses or single heads of households as relevant, and other resettlement assistance, such as skills training, access to credit and job opportunities, should be equally available to women and adapted to their needs. Where national law and tenure systems do not recognize the rights of women to hold or contact in property, measures should be considered to provide women as much protection as possible with the objective to achieve equity with men (ESS5 footnote 18)</li> <li>• Establish in the resettlement action plan the entitlements of affected persons and/or communities, paying particular attention to gender aspects and the needs of vulnerable segments of communities, and ensure that these entitlements are provided in a transparent, consistent, and equitable manner. The plan will incorporate arrangements to monitor the effectiveness of livelihood measures during implementation, as well as evaluation once implementation is completed (ESS5 para 33).</li> </ul>
<b>ESS 10: Stakeholder Engagement and Information Disclosure</b>	<ul style="list-style-type: none"> <li>• Identify the disadvantaged or vulnerable (ESS10 para 11)</li> <li>• Describe in the Stakeholder Engagement Plan (SEP) the measures used to remove obstacles to participation, and how the views of differently affected groups will be captured. Where applicable, the SEP will include differentiated measures to allow the effective participation of the disadvantaged or vulnerable (ESS10 para 16)</li> <li>• Provide stakeholders with access to the information on potential risks and impacts that might disproportionately affect the vulnerable and disadvantaged and describing the differentiated measures taken to avoid and minimize these (ESS10 para 19)</li> <li>• Disclose information in relevant local languages and in a manner that is accessible and culturally appropriate, taking into account any specific needs of groups that may be differentially or disproportionately affected by the project or groups of the population with specific information needs (such as disability, literacy, gender, mobility, differences in language or accessibility) (ESS10 para 20).</li> </ul>

Each component (scoping, identification, and assessment) of the SESA Study provides appropriate entry points in promoting gender equality. Promoting gender equality and inclusion of women are considered at implementation levels of SESA that was structured as followed:

- 1) Scoping (Initial gender issues and impacts in the region)
- 2) Identification of key gender-related access risks and impacts
- 3) Assessment of the gender-related risks and impacts and designing mitigation measures
- 4) Gender-responsive stakeholder engagement
- 5) Gender-responsive monitoring instruments

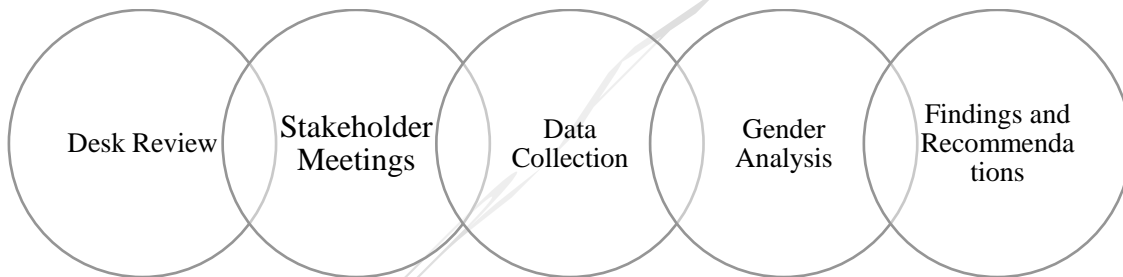
### 8.1.2. Gender Responsive SESA Implementation

To ensure a gender-responsive SESA implementation, specific activities designed and conducted during the process:

- 1) Gender briefings to the SESA team
- 2) Gender briefings to the OMO field team
- 3) Gender balanced SESA FAO team
- 4) Gender methodology and gender-sensitive questionnaire designs
- 5) Recruitment of a gender consultant
- 6) Collection of sex-disaggregated data
- 7) Gender specified section in scoping report, SESA report, and the SEF
- 8) Inclusive stakeholder engagement
- 9) Field team (survey implementation) including women and men members
- 10) Strong network among the women NGOs and key institutions in the Project Area

### 8.1.3. Gender Assessment Process

The gender assessment process consists of five main activities. These are desk review, stakeholder meetings, data collection, conducting gender analysis and findings and recommendations.



**Figure 8-2 Holistic Based Gender Assessment Process**

#### Desk Work

The first round of primary and secondary sources were collected and examined at field, intermediate, and macro levels. A preliminary gap analysis was conducted on existing sources based on type, level, context, and up-to-date information. The second round of collection of current sources has been started and is in progress.

Policies, plans, academic studies, maps, news, national and international reports, ongoing and completed projects, supports, and statistics were reviewed during the desk review.

#### Stakeholder Meetings

A field visit was conducted during the period of 22-25, September 2020. Initial consultations and observations were done during the field visit. Meeting and knowledge sharing platforms were established with various institutions, including governmental bodies, private sector, academia, and civil society organizations.

Findings of the field visits (short interviews with women farmers and meetings with institutions) and field observations were used to identify critical gender issues.

### Field Work/Data Collection

To collect sex-disaggregated data in rural areas of the CPA, gender-related questions are embedded into socio-economic community and household questionnaires.

In -depth interviews were conducted (between the period of 25 September-3 October 2020) with the participation of key informants.)

Additionally, in-depth interviews were conducted (between the period of January-February 2021) to women community members by phone and online meeting.

### Data Analysis

Close-ended questions in the community and household questionnaires were analyzed through SPSS software. Qualitative data and desk review sources were examined through contextual analysis concerning research questions. Analyzed data were interpreted considering the context of gender assessment.

### Findings

In the light of initial findings of desk review and stakeholder engagement, gender baseline and gap analysis were structured in the following sections.

#### 8.1.4. The Methodology of Prioritization

Prioritization of gender-related issues during the assessment process were made through below-mentioned steps:

**Table 8-2 Prioritization Methodology**

Step	SESA Component	Research Level
Identification of existing gender issues.	Scoping and Identification	Macro – Intermediate - Field
Identifying gender differences and the underlying causes of gender inequalities.	Scoping and Identification	Macro – Intermediate - Field
Comparison of data at the field level, meso level, and macro level.	Assessment	Macro – Intermediate - Field
Identification of commonly emphasized gender-related problems and prioritization of gender issues.	Assessment	Macro – Intermediate - Field

#### 8.1.5. Challenges

Below challenges and exit strategies faced during SESA process are identified as follows:

**Table 8-3 Challenges and Exit Strategies**

Challenge	Exit Strategy
General data gaps in the agriculture sector in terms of gender	To get up-to-date statistics and critical information about the relevant gender issues were collected from relevant institutions.

Lack of comparable sex-disaggregated data in rural and urban inhabitants	Significant data gaps in relation to gender issues consist of in-depth information and sex-disaggregated data at the village and household level. To close the data gap, community and household level surveys were designed, and gender-related questions were embedded into these surveys. Additionally, in-depth interviews were conducted by phone and/or online if there is a need to get much in-depth information about women's needs, problems, and coping strategies.
No identification in gender indicator set by the Turkish Statistical Institute in gender and agriculture production.	
Limited gender analysis on gender specified data of the Ministry of Agriculture and Forestry	
Old Statistics	
Male-dominated stakeholders	Briefings were given to both the SESA team and OMO (field team) to consider and enroll women in the decision making process.
Male-dominated field team	Three women are included in the field team, and they collected sex-disaggregated data.
Pandemic Situation (Covid 19)	Phone interviews were used to collect in-depth interviews. OMO has undertaken the fieldwork.

## 8.2. Gender Baseline

In light of the findings of gender analysis, gender baseline issues were identified to empower women living in the CPA. All issues are linked with TULIP sub-projects' potential impacts not only for adverse aspects but also for positive aspects. In this context, entry points for gender baseline are structured as follows.

## 8.3. Gender Responsive Planning

There are a set of laws, policy documents, and plans regarding promoting gender equality. Relevant macro-scale documents assessed for the TULIP project is as follows:

**Table 8-4 Relevant laws, Policy Papers and International Conventions**

Laws	Content
The Constitution Law no : 2709 Official newspaper date: 9/11/1982	Articles 41, 66 (2001), Articles 10, 90 (2004), Article 10 (2010).
Turkish Civil Code Law no:4721 Official newspaper date: 8/12/2001	The law upholds equality between women and men, puts an end to sexual discrimination.
The Law on the Protection of Family and Prevention of Violence against Women Law no:6284 Official newspaper date: 8/3/2012	The law includes specific arrangements to end violence against women.
Labour Law Law no: 4857 Official newspaper date: 10/6/2003	Any discrimination concerning fundamental civil rights, including sex, could not be made in employer-employee relations.
Restructuring Specific Debts and Amending the Social Insurance Law and Specific Laws and Statutory Decrees Law no:6824 Official newspaper date:8/03/2017	The wages and premiums of the times worked shall be paid by the employer.

Turkish Penal Code Law no: 5237 Official newspaper date: 12/10/2004	The law includes modern arrangements for gender equality and violence against women.
Civil Servants Law Law no: 657 Official newspaper date: 23/7/1965	The personal rights of female employees and parents
The Revenue and Corporate Taxes Law Law no: 193 Official newspaper date: 31/12/1960	Women's income by selling the home-made products in the charity sales, festivals, and fairs and at places determined temporarily by the state institution and organizations was deemed exempt of tax.
Laws on Project Support to Investments	Private crèches and day-care centers are exempted from the revenue and corporate taxes for five fiscal/taxation periods.
The Law Amending the Republic of Turkey Retirement Fund of Civil Servants Law no: 5434 Official newspaper date:17/6/1949	Female farmers engaged in agricultural activities on their behalves should be the head of the family to be covered by the insurance.
The Prime Ministry Circular No. 2004/7 on Acting in accordance with the Principle of Equality in Staff Recruitment"	The Circular aimed at preventing sexual discrimination in personnel recruitment.
The Prime Ministry Circular No. 2010/14 on "Increasing Women's Employment and Promotion of Equality in Opportunities"	The Circular aimed at increasing women employment and to implement equal pay for equal work principle for strengthening the socio-economic positions of women
The Rural Development Investments Support Programme by the Ministry of Agriculture and Forestry	In the parts of investment projects with 50% grant; in case that the project owner is a female farmer, extra 2 points are added to the points table according to the pre-assessment criteria; and additional 4 points are also added if the woman is a member of agricultural cooperative or union. In case that female farmers engaged in agriculture apply for machinery-equipment purchases within the scope of the project, they can benefit from a 50% grant for 35 types of machines.
The Law No.5510	Those in insured employment in home-based services shall be considered in the relevant proceedings depending on whether they are recruited less or more than ten days a month. Those recruited less than ten days a month shall be insured against occupational accidents and diseases. Their premiums shall be covered by the employers. The insured shall be entitled to pay their long-term and general health insurance premiums until the end of the following month if they choose to do so. On the other hand, the premiums of those recruited for ten days and longer a month shall be paid by their employers in the scope of accessible employment practices.
Policy Papers and Plans	
11 <sup>th</sup> Development Plan(2019-2023)	Specific targets and situation analysis regarding the empowerment of women were explained in the plan.
East 11 <sup>th</sup> Development Plan Blacksea Regional Plan(2014-2023)	Specific information about the TR90 region – including Ordu Province – exists in the plan.
The Strategy Paper and Action Plan on Women's Empowerment(2018-2023)	The Action Plan aimed at the promotion of women's participation in economic and social life; ensuring women's equal access to rights and opportunities; mainstreaming the principle of equality between women and men into all main plans and programs
The National Action Plan on Combating Violence against Women (2016-2020)	The contribution and participation of institutions and organizations consider the relevant international conventions being a party, particularly the Istanbul

	Convention and provisions of national legislation, relevant research and evaluation reports, and recent social needs and developments.
The Strategy Paper and Action Plan on Combating Early and Forced Marriages(2018-2023)	The main goal of which is to decrease the early and forced marriages and empower the girls.
Rural Development Special Commission Report (2018)	A separate section on rural women as vulnerable groups exists in the plan.
Tokat Provincial Action Plan On Combating Violence Against Women (2018-2021)	The plan includes entry points, responsible institutions, and activities fighting violence against women in Tokat Province.
Çorum Provincial Action Plan On Combating Violence Against Women (2018-2021)	The plan includes entry points, responsible institutions, and activities fighting violence against women in Çorum Province.
International Conventions	
The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (1979)	CEDAW was submitted for signature on 1st March 1980, after the Second World Conference on Women. The convention adopted by Turkey in 1985 entered into effect on 19th January 1986.
Council of Europe Convention on Preventing and Combating Violence Against Women and Domestic Violence (The Istanbul Convention) (2011)	Strategy Paper and Action Plan on Combating Early and Forced Marriages, including five targets and 29 activities.

Relevant legislation and planning on a macro scale are sufficient and inclusive for the implementation period for TULIP sub-projects that will focus on gender equality. Strengthening women in socio-economic life have been elaborated in education, health, economy, land-taking processes, media, violence, and rural development in the laws mentioned above and plans at the national and provincial levels.

The project plans, which will be carried out exclusively for women and where women will participate, are indicated in accordance with the country development plan and rural development strategies. However, based on the areas of activity and the project's efficiency, alternative project proposals have been developed. These are included in the assessment section.

### 8.3.1. Women Oriented Projects

In the partnership of institutions, several projects are implemented for supporting women. These are identified in the table below.

**Table 8-5 List of Women-oriented Projects**

No	Project Title	Area	Year	Authorizing Institution/	Remarks
1	Women Farmer Trainings: "Don't Let Calves Die, Don't Let Farms Desolate" Project	Husbandry	2019	Tokat Directorate of Provincial Agriculture and Forestry	56 meetings were held with farmers. 1.130 women farmers attended the training.

No	Project Title	Area	Year	Authorizing Institution/	Remarks
2	"Strengthening Women Entrepreneurship in Agriculture" project	Women in Rural Development	2017	Ministry of Food, Agriculture and Livestock	Certified entrepreneurship training for employment initiated with the cooperation of Provincial Directorate of Ministry of Food, Agriculture and Livestock, İŞKUR and KOSGEB was given to 75 women farmers from all over Tokat.
3	Employment and Entrepreneurship Development Training Project (İGGEPE)	Entrepreneurship	2010	İŞKUR and ÇSGB	177 women received certificates. 92 women were employed in various textile companies. 13 women started home-based work in Çorum Sungurlu for companies operating in the garment and drapery industry in the district.
4	Women Farmers Agricultural Extension Services	Agricultural Extension Services		Yozgat Directorate of Provincial Agriculture and Forestry	
5	Program for Strengthening Women's Entrepreneurship in Agriculture	Entrepreneurship	2017	Tokel Directorate of Provincial Agriculture and Forestry İŞKUR and KOSGEB	3 Entrepreneurship Courses of 32 hours 75 women farmers who attended the course prepared 75 projects at the end of this course.

Source: TRGM 2020

In rural areas, women cannot benefit from agricultural extension services on an equal basis with male farmers, as is the case with many other opportunities. In this project, pioneering, exemplary and women-oriented extension practices should be implemented for a gender sensitive extension understanding.

It is important to develop training programs within the framework of the training needs analysis in the project area and the stakeholder participation of rural women.

It is very positive that these projects are increasing production and revenue. It will be essential to increase the number of women beneficiaries and spread them to all districts covering the basin. Additionally, there is a need for more women-specific project designs. In addition, through the projects, women farmers should be equipped with organizational skills and thus contribute to the development of social capital in rural areas.

Diversification of cooperation would be beneficial. When determining beneficiaries in these projects, it is stated that positive discrimination is provided to women and prioritizing in the evaluation process.

### 8.3.2. Visibility and Awareness

Among the beneficiaries, the Rural Development Unit under the Provincial Directorate of Agriculture and Forestry has project and training responsibilities regarding Women Farmers.

All technical and medical personnel are extension agents. Women extension agents are closely working with women farmers. Producers are obliged to provide up-to-date information and data on agriculture and livestock.

Disadvantaged situations of women emphasized during initial stakeholder meetings and the importance of agricultural supports to women farmers, reducing domestic responsibilities of elderly women and empowering situations of women migrant workers were underlined. However, when examining sub-projects, the mentioned issues are not reflected in women-specific projects. When the project-based impacts are analyzed, it is essential to set the needs and effects regarding men and women. This can be achieved through increasing awareness of government officials on gender.

Investing in women is critical to achieving sustainable development goals. Gender equality and women's empowerment are both a goal and a solution to the global sustainability problem. Development activities should not leave anyone behind and should be socially inclusive and fair.

It is noteworthy that during field surveys, the muhtars are not able to provide details about women, and some muhtars provided the contact information of men in the household, although it is explicitly stated that the interviews will be conducted with women.

Gender awareness will also be important in raising awareness for the muhtars at this point. Gender awareness will also be important in raising awareness for the muhtars at this point. Women are counted as a vulnerable group in the Project Area and specific attention should be paid to disadvantaged women having deeper vulnerabilities in the region.

### **8.3.3. Vulnerability**

Disparities between women and men from disadvantaged socio-economic backgrounds exist in Turkey (The World Bank, CPF Turkey). Women and men community members are affected differently by change, they have different needs, problems and coping strategies and access to resources. These disparities are much clear in rural areas. Especially, people with disabilities, elderly, poor, refugee, seasonal workers, divorced and household heads have deeper vulnerabilities in rural and urban communities.

#### ***Elderly Women***

According to Turksat 2019 data, a total of 2.259523 people living in Çekerek Basin Provinces and 1.105.730 of them are women.

- (i) 307.809 women are living in Tokat and total its population is 668.497;
- (ii) 211.073 women are living in Yozgat and total its population is 421.200;
- (iii) 267.516 women are living in Çorum and total its population is 530.870 and
- (iv) 319.332 women are living in Sivas and total its population 638.956.

Distribution of population by age can be seen for four provinces in Table 8-6.

Child population decreases in Çekerek Basin provinces due to migration and birth rate.

The highest men and women population in Tokat is between the ages of 20 and 34. the lowest women population appears in the 0-6 age range, while men are 65 years and older.

In the province of Yozgat, while the men and female women population between the ages of 0-9 is close, this difference is increasing over the age of 65. The age range in which the women population is most concentrated is seen as 20-34.

In the province of Çorum, the population is densely populated between the ages of 35-49. The population density of women and men is mostly in this age range. Apart from this, there are no significant differences between the men and women populations in age groups.

The age group with the highest population density in Sivas is between the ages of 20-34. While the lowest womenpopulation density is found between the ages of 0-9, the lowest menpopulation density is seen at the age of 65 and above.

**Table 8-6 Distribution of Population by Age**

	Total	Women	Men
<b>Age Groups</b>	<b>TOKAT Province /Total Pouplation: 668.497</b>		
Age (0-6)	76.953	37.399	39.554
Age (7-19)	91.309	44.653	46.656
Age (20-34)	128.529	63.219	65.310
Age (35-49)	121.823	60.961	60.862
Age (50-64)	166.763	55.796	55.171
Age (over 65)	83.128	45.781	37.347
<b>Age Groups</b>	<b>YOZGAT Province /Total Pouplation: 421.200</b>		
Age (0-6)	55.328	26.951	28.377
Age (7-19)	78.849	32.332	33.424
Age (20-34)	91.884	45.367	46.517
Age (35-49)	80.070	39.138	40.932
Age (50-64)	72.055	35.999	36.056
Age (over 65)	56.107	31.286	24.821
<b>Age Groups</b>	<b>ÇORUM Province /Total Pouplation: 530.870</b>		
Age (0-6)	66.711	32.419	34.292
Age (7-19)	73.355	35.872	37.483
Age (20-34)	104.631	51.463	53.168
Age (35-49)	109.706	54.826	54.880
Age (50-64)	96.628	48.702	47.926
Age (over 65)	79.839	44.234	35.605
<b>Age Groups</b>	<b>SIVASProvince /Total Pouplation: 638.956</b>		
Age (0-6)	85.482	41.569	43.913
Age (7-19)	97.917	48.616	49.301
Age (20-34)	148.717	73.229	75.488
Age (35-49)	122.500	60.407	62.093

Age (50-64)	103.261	51.346	51.915
Age (over 65)	81.079	44.165	36.914

Source: Turkstat 2019

The number of women aged over 50 is high in the Project Area. According to the interview data, most of the elderly women live with their children's houses. They are cared for by the younger women – usually wife of their son in the household.

Since the elderly cannot receive health and care services in their own living environment, their transportation to and from the district hospitals for these services creates difficulties especially in winter conditions.

### **Disabled Women**

According to CLQ data, some villages have a very high number of disabled people. There are physically disabled women in 42,4% of the villages. There are mentally disabled women in 33,3% of the villages. Interviews couldn't directly be conducted to disabled women, but interviews were conducted to Muhktars. According to interview data, limited infrastructure and lack of health facilities in neighborhoods hinder disabled patients to fully benefit from health services.

Women in the household are the main responsible person for caring for disabled people. Caring responsibilities play an important role in women's participation in socio-economic life.

### **Poor Women**

According to TurkStat 2015 statistics lavatory system is existent in most households.

**Table 8-7 Well-Being Index for CPA Provinces**

Provinces	Lavatory system in the household (%)	Person facing problems as per the house's quality (%)	Savings depozit per capita	Households having medium and upper-income level (%)	Households that can not meet their basic needs (%)
<b>Tokat</b>	95,2	18,6	2,260	29,7	44,7
<b>Yozgat</b>	85,2	28,7	3,806	26,0	51,0
<b>Çorum</b>	92,0	20,4	3,822	30,7	53,3
<b>Sivas</b>	93,1	20,2	4,719	33,5	40,7

Source: Turkstat, 2015

According to the indicators in 2015, the toilet system in the houses is highly available in all four provinces. With a ratio of 85.2, yozgat is in the last place. Looking at the rates of those who have problems in the quality of the house, Yozgat takes the first place with 28.7, while this rate is 18.6 in Tokat. Sivast ranks first in per capita savings deposit rates, while Tokat has the lowest rate. Sivas ranks first in the ratio of households in the middle and higher income group, while Yozgat is 26.0 percent. Finally, Çorum ranks first among the ratio of households that cannot meet their basic needs. Although this information is not sex-disaggregated, we may conclude that 51% of women in Yozgat and 53,3% women in Çorum face poverty in the Project area's households

According to CLQ data, a total of 667 women in 112 of the villages are poor villager women who live on social assistance. An average of 5.96 women in the villages are poor and live on aid.

At the same time, in 53,1% of the villages there are very old and lonely women. According to the statements of the Mukhtars, there are 456 very old and lonely women in 94 villages. The average number of very old women living alone in the villages is 4,85.

### **Divorced women**

**Table 8-8 Reasons for Ending Marriage in CPA Provinces**

	Mental illness	Violence	Felony and infamy	Incompatibility	Abandonment	Adultery	Other
Çorum	2			871	1	1	1
Tokat	1		1	807	1	2	
Yozgat				525	2	1	
Sivas		1		689	1		165

Source: Turkstat 2019

When looking at the data on the reasons for divorce of four provinces, it was noted that the main reason was incompatibility.

### **Women Headed Households**

There are women-headed households in almost all neighborhoods. These households are mostly chaired by elderly women or women whose husbands migrate for seasonal jobs or work abroad.

**Table 8-9 Number of Family Members in Households**

Province	Total	Single person headed households	Single-family headed households	Households including at least one nuclear family and other persons	Households including no nuclear family but more than one person
Tokat	185,960	34,937	117,667	29,932	3,424
Yozgat	129,928	25,635	82,075	18,771	3,447
Çorum	173,532	34,066	110,662	24,604	4,200
Sivas	185,050	33,396	119,269	28,394	3,991

Source: Turkstat 2019

It is possible to say that single person headed households are mostly in Tokat and least in Yozgat. Single headed households are mostly located in Sivas. Households that include at least one nuclear family and other people are mostly seen in Tokat and least in Yozgat. The households without a nuclear family but containing more than one person are mostly in Çorum.

As it can be seen in the Table 8-9, the number of single-person headed and single-family headed households is considerably high.

### **Women Seasonal Workers**

During the interviews, it was stated by the women that many household members organized the livestock business themselves. People with large lands have to employ seasonal workers.

During the fieldwork period, there were no surveys or interviews with seasonal female workers, as the region did not have a harvest season.

### **Refugee Women**

There are a limited number of refugee women. No survey or interview was conducted with refugee women due to a lack of contact information.

#### **8.3.4. Education**

Traditional values generally cause low participation of women in education. Because women's participation in education depends on the male members of the family rather than the individual decisions of the women. The education level of women in Çekerek Project Area is low. There is a concentration in women who are primary school graduates. There is more privilege in accessing educational opportunities for boys. Girls do not study after primary school on the grounds that "girls do not need to go to school any more."

Looking at the data for Tokat in the Table 8-10, it can be said that while the density of women is higher in primary school education, men have a more dense population in secondary school and beyond. According to the data of the Yozgat, while the data of women are higher than men in the primary education process, the density of men is higher for the next stages.

The women population in primary school in Çorum is high, but as in other cities, the male population increases as the education progresses. Sivas is in the same profile as other cities in terms of gender-based education indicators. While the female population is higher in primary school, then this rate is less than men.

According to Türksat 2019 data, the majority of women in the Project Area Provinces have graduated from primary school (281.936). The number of women graduating from college and faculty in the region is 86,647. When we look at the distribution of women attending this higher education by provinces; 36% in Sivas, 25% in Çorum, 20% in Tokat and 18% in Yozgat. Encouraging women to enroll in formal education is one of the key factors to empower women in society.

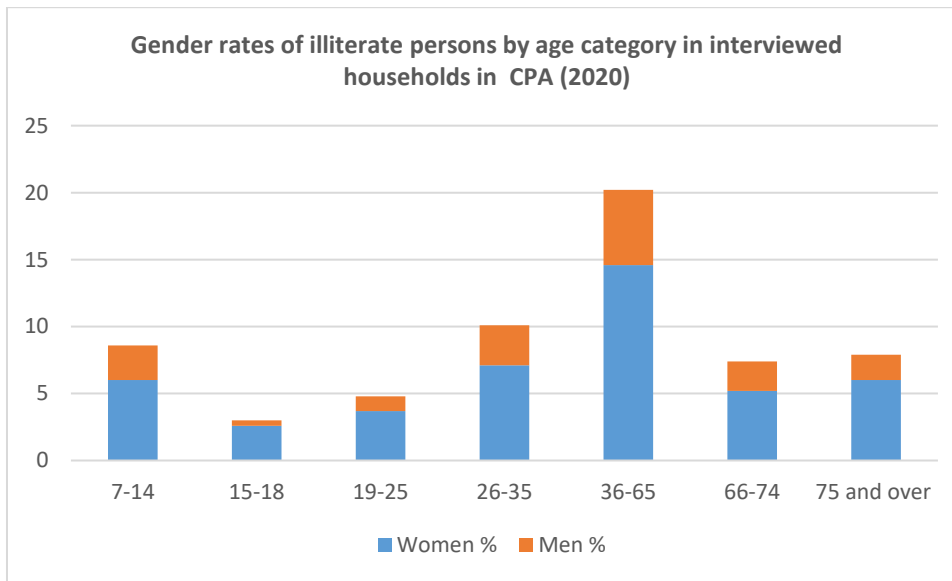
**Table 8-10 Education Levels by Gender in CPA Provinces**

Gender	Primary School	Elementary School	Middle School	Highschool	College & Faculty	Ph.D	Not Known
<b>TOKAT</b>							
Women	64,785	15,439	31,565	27,018	17,276	113	1,364
Men	59,095	20,091	42,446	44,956	22,597	190	1,301
Total	123,880	35,530	74,011	71,974	39,873	303	2,665
<b>YOZGAT</b>							
Women	62,278	13,577	29,623	29,104	15,616	242	4,075
Men	45,995	14,997	36,756	44,746	20,966	400	3,572
Total	108,273	28,574	66,379	73,850	36,582	642	7,647
<b>ÇORUM</b>							

Women	76,695	19,475	36,022	35,744	22,441	291	1,760
Men	61,636	24,490	43,848	48,838	29,414	520	1,750
Total	138,331	43,965	79,870	84,582	51,855	811	3,510
<b>SIVAS</b>							
Women	77,936	19,504	46,238	53,300	31,314	638	3,486
Men	61,337	22,346	58,185	73,831	39,071	999	2,867
Total	139,273	41,850	104,423	127,131	70,385	1,637	6,353

Source: TurkStat, 2019

According to the interviewed 267 household data shows that among the illiterate people in the CPA the proportion of women (72.6%) is higher than that of men (27.4%).



**Figure 8-3 Gender Rates of Illiterate Persons by Age Category**

Source: Household Survey – Çekerek Project Area, 2020.

It has been seen that high illiteracy rate is the 36-65 age women population in Çekerek Project Area (see Figure 8-3).

It can be concluded that the high illiteracy rate is a result of the lower schooling rates of girls in the CPA compared to boys. It is a fundamental issue that prevents women's participation in socio-economic life and should be taken into account during the design and implementation of sub-projects.

**Table 8-11 Education Level**

Province	Net enrollment rate in preschool (3-5 age) (%)	Rate of college & faculty graduates (%)	Rate of satisfaction on public education services (%)
Tokat	47,9	11,8	78,6
Yozgat	32,6	9,9	82,5
Çorum	34,8	10,8	69,2
Sivas	29,0	13,2	72,4

Source: TurkStat, 2019

The pre-school enrollment rate for the age range of 3 and 5 is higher than the other three in Tokat. The rate of university graduates is highest in Sivas and lowest in Yozgat. Satisfaction with public education services is highest in Yozgat and lowest in Çorum.

According to the statement of the mukhtars of the settlements interviewed within the Çekerek Project Area, 84,1% of 177 settlements do not have a primary school. The rate of settlements with no secondary school is 87,5%. This shows that there is a limited access to educational opportunities. Primary education is carried out with the transported education system. The rate of residential areas where transported education is provided is 89,2%. There are some problems occurred with the transported education, for example, when the school bus accepts students from a single point, students living far away cannot go to school..When the situation is analyzed in terms of gender, it is seen that girls are negatively affected and schooling rates of girls have decreased.

Education is one of the most important factors affecting women's participation in employment, entrepreneurship and social status in rural areas. In the CPA, there are important problems in education for women, especially in participation in formal education and continuity of education. It is important to raise awareness of the society by cooperating with all relevant public institutions, organizations and non-governmental organizations in order to reduce the effect of gendered views that constitutes an impediment to the education of women in society. Therefore, the needs for educational services within the project area should be taken into consideration and operations supporting girls/women's access to education in particular should be considered in planning.

In addition, in areas where transported education is provided, the risk of road conditions in winter creates concerns for families. For this reason, safe transportation opportunities, road maintenance and repairs are demanded, especially in areas with transported education. The proportion of residential areas with transportation problems in the region is 40,9%. We can list the general problems put forward by the settlements in their statements regarding the road infrastructure service they already have as follows: road maintenance is neglected; roads are narrow, bends, dangerous, muddy, unpaved or unfinished.

### 8.3.5. Health

There are significant opportunities and access inequalities in rural and urban areas in terms of health opportunities. This situation can also affect the active participation of rural women in all areas of society and private life. In order to solve the health problems of women in rural areas, it is important that all individuals in general and especially women in rural areas have health insurance.

Rural women face some adverse conditions in health issues such as limited caring services, home birth, gave birth at early age. Additionally, consanguineous marriage is common in the CPA (see Table 8-12) and it would carry some risks on maternal and infant's health.

**Table 8-12 Marriages between First Cousins**

Province	Numbers of marriages	Numbers of marriages between first cousins	Proportion of marriages between first cousins (%)
Tokat	3624	114	3,1

<b>Çorum</b>	3508	94	2,7
<b>Yozgat</b>	3182	105	3,3
<b>Sivas</b>	4028	125	3,1

Source: Turkstat 2019

On the other hand, working as an unpaid family worker brings the risk of not having social security. Therefore, women may not fully benefit from protective health services in terms of work accidents and occupational diseases (Turkish Grand National Assembly, 2018).

The basin has a high rate of elderly population. Therefore access to health services is one of the needs of rural women in the Project Area. Especially elderly and lonely women find it difficult to benefit from health services. Mobile health units should be expanded in the region for these people.

Specialized health services such as psychiatry and geriatrics are needed. During interviews, it was mentioned by women that existing health facilities and the number of personnel were not enough. Satisfaction level with public health services in Tokat is the highest with 82.1, while Çorum the lowest with 78,2.

Some health indicators can be seen in Table 8-13:

According to TurkStat data, it is seen that the fertility rate of Yozgat and Sivas has been lower than both the regional average and the country average since 2009 and the inclination direction has followed a negative course. In 2013, Yozgat's crude birth rate was 13,9 per thousand and it was ranked 46th across the country. The aging of the population in the provinces of Yozgat and Sivas and the migration of the young population to other provinces are the reasons for the low birth rate.

**Table 8-13 Health Indicators**

<b>Province</b>	<b>Baby mortality rate (%)</b>	<b>Life expectancy at birth</b>	<b>Number of registration per doctor</b>	<b>Satisfaction level of people's own health (%)</b>	<b>Satisfaction level of public health services (%)</b>
Tokat	11,8	77,6	5,591	71,8	82,1
Yozgat	10,7	77,8	5,404	69,7	81,1
Çorum	9,5	78,3	6,765	78,2	78,2
Sivas	8,6	77,8	4,319	69,2	79,4

Source: TurkStat, 2015

The Table 8-13 of health indicators reveals that baby mortality rates are seen at least in Sivas and highest in Tokat. According to the life expectancy of the birth, it is close to 77.8 in 4 provinces. The highest number of enrollment per doctor in provinces is in Çorum the least in Sivas. While the level of self-satisfaction of people is high in Çorum, Sivas is the lowest with a rate of 69.2. Satisfaction with healthcare services in Tokat is the highest with 82.1, while Sivas is the lowest with 79,4.

Limitations on transportation also hinder women's access to health services. Rural women face difficulties to reach hospitals in the case of emergency, treatment and care needs. Limited transportation also a strong barrier for women to access maternal care services.

### 8.3.6. Skill Development

Rural women face difficulties in accessing vocational trainings and life-long opportunities. To adapt rural women to national and global labor requirements and empower them in socio-economic life, the provision of opportunities for skill development and knowledge sharing platforms is a must. Women need to adapt up-to-date information and increase their skills to meet labor requirements.

Increasing vocational training opportunities has vital to empower women in socio-economic life (Kulak 2011 Aktaran Gazioğlu, 2014). All of interviewed women mentioned that they did not participate a skill development or life long trainings in their neighborhoods.

Women face difficulties in benefiting from agricultural extension services due to their domestic responsibilities, including child care, and due to their low education level (TGNA, 2018).

It is observed that the participation of women in agricultural trainings given to farmers in the Project Area is low. Specific measures such as flexible hours, care facilities, gender awareness trainings should be considered to increase women's participation in vocational and lifelong trainings.

On a separate note, it is critical that women needs innovative, entrepreneurial, multi-functional and participatory trainings. Trainings on traditional gendered areas such as handicraft trainings, bread making, child care would strengthen gender inequality and women's disadvantaged situation in the society.

### 8.3.7. Technology Use

Cultural values that impose that the primary duty of women is housework and childcare, prevent women from accessing educational opportunities; the patriarchal nature of thought and the insufficiency of economic conditions deprive women of the opportunity to continue education. There are adverse conditions for women to access basic education and technology education. The existence of gender-based prejudices that women are not inclined to use technological tools prevents women from benefiting from employment opportunities created by technological developments.

All of interviewed women mentioned that they have no enough knowledge and skills about technology. Innovation and new approaches are key factors that rural women can catch the global trends and adapt themselves in economic life. Modern agricultural techniques and trainings would be key in design and implementation of sub-projects.

### 8.3.8. Employment

Turkey has one of the lowest female labor participation rates among countries with similar income levels (The World Bank, CPF Turkey). Women's labor force participation differs according to different regions. The ratio of women and men employed in Provinces of CPA is as follows:

**Table 8-14 Main Labour Force Indicators by CPA Provinces**

Province	Labour force	Unemployment rate	Employment rate
----------	--------------	-------------------	-----------------

Çorum	52,0	5,9	48,9
Tokat	49,9	6,6	46,7
Sivas	49,7	10,0	44,7
Yozgat	51,5	8,6	47,1

Turkstat, 2013

Labor force participation rate shows close rates in four provinces however, the highest rate is in Çorum. The highest unemployment rate is in Sivas. Looking at the rate of employment, it has resulted in similar results in four provinces with a rate of approximately 48.0 (see Table 8-14).

**Table 8-15 Employment by Gender**

Province	Women Registered Employment (Province) Rate (%)	Men Registered Employment (Province) Rate (%)
Sivas, Yozgat TR72	26,3	68,8
Çorum, Tokat, TR83	37,9	70,9

Source: TurkStat, 2019

When we look at the women employment rates, it is 26.3 in Sivas and Yozgat provinces and 68.8 for men. In Çorum and Tokat, provinces, the rate of women is 37.9 and the rate of men is 70.9 (see Table 8-15).

Creation of registered employment and assured work opportunities are key instruments to empower in socio-economic life. In this framework, local registered employment opportunities for women would be crucial in TULIP project.

**Table 8-16 Paid and Unpaid Working by Gender**

Province	Paid, Salaried and Waged		Unpaid Family Workers		TOTAL
	Women	Men	Women	Men	
TR83 (Tokat, Çorum)	165	354	181	70	<b>770</b>
TR72 (Yozgat, Sivas)	113	380	63	23	<b>579</b>
TOTAL	<b>278</b>	<b>734</b>	<b>244</b>	<b>93</b>	<b>1349</b>

Source: TurkStat, 2019

The data for registered working areas reveal that the number of waged, salaried and paid women is approximately half the number of men in Tokat and Çorum provinces (TR 83 Region). In Yozgat and Sivas (TR72 Region), this difference is even greater, with 380 men and 113 women. In unpaid family work, the number of women is 181 in Tokat and Çorum provinces, the number of men is 70 (see Table 8-16). While the rate of women in Yozgat and Sivas is lower than the other two, but still higher than men. Most of the rural women work as unpaid family workers.

The most important role women play in rural areas is agricultural production. In rural areas, the majority of women are employed in marginal jobs and these women are positioned as unpaid family workers.

**Table 8-17 Labor Force by Gender**

	People not in Labor Force (2019)	Having No Hope To Work	Seasonal Workers	Dealing With Houseworks	Education and Training	Retired	Unavailable for Work
TR83 Man	298	13	3	0	60	128	66
TR83 Woman	680	5	2	373	64	34	148
TR72 Man	283	6	1	0	72	142	37
TR72 Woman	672	8	2	191	84	13	37

Source: TurkStat,2019

Considering those who are not in the labor force, it is possible to state that the rate of women is high in all four provinces. Those who have no hope of working are mostly seen among men in Tokat and Çorum. Among the four provinces, women are still responsible for the houseworks. The rate of retired men in Tokat and Çorum is higher than the other two (see Table 8-17)

It is observed that women in rural settlements in the basin are predominantly engaged in agriculture and animal husbandry. It is also seen that they produce local cheeses from animal products and market them through cooperatives. In addition, it was stated that women engaged in non-agricultural activities were generally engaged in carpet weaving (Yıldızeli Women's Enterprise, Production and Management Cooperative members, February 2021).

The level of participation of women in production in the agricultural sector varies according to the family's land and animal assets, income and product pattern. However, as the level of mechanization increases in agriculture, women become detached from agricultural production and turn to housewifery.

Among the women we interviewed, spouses for married women or young women with children and male family members for single young women are included in the job search process; women decide their way of participating and working in the labor market depending on the responsibilities they undertake because of their gender rather than their own free choice and individual decisions. Cultural and social roles, prejudices and the division of labor in the family shape the decision of women to participate in the labor market within Çekerek Project Area.

### 8.3.9. Entrepreneurship

The fact that women's entrepreneurship is often ignored is also valid for women in the Çekerek Project Area. In terms of entrepreneurship it is expected that women should be encouraged with an affirmative action perspective and organizations should be supported further and more efficiently.

They need more support to put all organizations of producers (founded by and predominantly consists of women) into an effective position. Women should also take part in effective and decision-making positions in the same cooperative with men.

Women led enterprises, including cooperatives, are crucial components for rural development.

In the field, it is observed that women are very enthusiastic to work in paid jobs and start a business, and open to improvement. As in all rural areas, it has been observed that the most

important obstacle to women here is the lack of education. Although women and girls in rural areas are more willing to receive education, they cannot continue their education due to insufficient resources and patriarchal structure. Also, non-formal education programs to be carried out considering the needs of the region are also very important. Making the necessary arrangements for girls to continue their education and cooperating with the local government is a necessity for the region.

Rural women in the region play a very ineffective role in the marketing of the products. Since the land ownership belongs to the men in the region, they are responsible for the money affairs. Therefore, women do not have control over the marketing of the products they produce.

**Table 8-18 Entrepreneurship by Gender**

	Total	Total wage earner	Total employers and self-employed	Unpaid family worker
TR83 Man	668	354	244	70
TR83 Woman	379	165	33	181
TR72 Man	546	380	143	23
TR72 Woman	193	113	17	63

Source: Turkstat 2019

Entrepreneurship and marketing issues remain marginal due to the inability of rural women to own property and their lack of education. It is possible to identify women with entrepreneurial characteristics and develop markets and provide credit opportunities for these women, at least for the products they produce. Studies have shown that, albeit small, women are ready for such entrepreneurial activities. In particular, the natural environment in which they live can be turned into a field of attraction, enabling women to create opportunities to earn income where they live. This is also related to the rural women using natural resources in the places they live.

It was observed that some of the women interviewed in the field produced jam etc. from the products grown in their environment, researched ways of marketing them and entered the process of becoming cooperative through organizing.

The number of women entrepreneurs is 33 in TR83 Region (including Tokat-Çorum) and 17 in TR72 Region (including Yozgat-Sivas). The number for men is 287 and 244 respectively (see Table 8-18).

The number of women enterprises in the Project Area is quite low and 6 women entrepreneurs were interviewed within the scope of CLQ survey sample (September, 2020). None of women entrepreneurs applied for credits, loans or supports while establishing their own business but they expressed their interest to benefit from such opportunities.

It has been observed that with the support of local governments women's cooperatives initiatives have started in the project area. The cooperatives which had local support for space and equipment are as follows;

- Çekerek Women's Enterprise, Production and Management Cooperative
- Sulusaray Women's Enterprise, Production and Management Cooperative
- Yeşilyurt Women's Enterprise and Management Cooperative
- Artova Women's Production and Management Cooperative

- Yıldızeli Women's Enterprise, Production and Management Cooperative.

Promotion of local women storekeepers, tradekeepers, and women cooperatives, the possibility of local purchasing, and the possibility of new entrepreneurial areas in the agricultural sector were assessed during SESA Process.

### 8.3.10. Time Poverty

The majority of women in the project area spend their daily lives with agricultural activities and household responsibilities. The intensity of the household burden varies according to the size of the family and the children and elderly population in need of care.

Descriptions of male and female labor force patterns in terms of time use show that wage labor covers a significant amount of men's time per day, while housework covers most of women's daytime activities.

### 8.3.11. Gender Based Violence (GBV)

Violence against women remains its importance in gender issues. Violence against women can be a form of physical, emotional, economical, psychological, or sexual. Rural women have additional vulnerability against violence. It reduces their well-being and their ability to work and involvement in socio-economic life. Rural women face a variety of risks, such as fetching wood for fuel from distant locations or walking in dark.

On the other hand, it is possible to observe economic violence, which is domestic violence and affects the life and livelihood of women, in both urban and rural areas. It has been revealed in the interviews that economic violence occurs in the following ways: Even though women want to work, they are forbidden and prevented from working by their husbands or male members of the household, and the control of women's own money is restricted.

It is observed that women are prevented from working in urban areas at a higher rate than in rural areas. It is seen that economic violence against women is experienced more deeply by women who lack social security. Women who are subjected to economic violence often find it difficult to improve their quality of life and are deprived of the necessary resources for life.

Empowering rural women economically would reduce their vulnerability to abuse. Provision of access to land, credit, and other resources and include rural women in decision making bodies would enable the empowerment of rural women. Besides, the sub-projects' possibility of having conflict factors will be assessed during the process. Especially, gray sub-projects include construction works and the presence of construction workers in the communities may have the potential to increase conflict and tension on rural women, as well as gender-based violence risks.

**Table 8-19 Violence Against Women in the Provinces of CPA**

The Name of The City	TR83		TR72	
	Tokat	Çorum	Yozgat	Sivas
Sexual Violence Against Women, By Spouse or Partner, Rate	9.9		9.9	

Sexual Violence Against Women, By Anyone Except the Partner, Rate	2.8	1.8
Physical Violence Against Women, By Anyone Except the Partner, Rate	11.4	17
Physical Violence Against Women, By Spouse or Partner, Rate	34.3	42.8
Physical/Sexual Violence Against Women, By Spouse or Partner, Rate	35.1	44.5

Source: Kadına Yönelik Şiddet Araştırması, ASPB, 2014,

In Table 8-19, it is seen that the proportion of women in the family who stated that they experience physical and sexual violence together, especially from men with whom they have close relationships, is high in Yozgat and Sivas provinces in the TR72 region.

**Table 8-20 Women's Guest House Service Data in the Provinces of CPA (2020)**

<i>Services and Their Users</i>	<b>Tokat</b>	<b>Çorum</b>	<b>Yozgat</b>	<b>Sivas</b>
<i>Number of Women's Guesthouses</i>	1	1	1	1
<i>Female Guest House Capacity</i>	20	20	20	20
<i>Number of Children Receiving Service</i>	107	124	117	198
<i>Number of Women Receiving Service</i>	172	269	165	271

Source: Ministry of Family and Social Services, 2020

In all provinces of CPA, there are Violence Prevention and Monitoring Center (ŞÖNİM) organizations and Women's Guest House, which regulate the legal, health and psychological support of women subjected to violence and the implementation of cautionary decisions and ensure that these decisions are followed. Among the provinces, the province with the highest number of people receiving service from ŞÖNİM is Çorum and the province with the lowest is Yozgat (See Table 8-21). There is one Guesthouse in each of the provinces.

**Table 8-21 Data of Violence Prevention and Monitoring Center in the Provinces of CPA**

<b>Service Receivers from ŞÖNİMs</b>	<b>Tokat</b>	<b>Çorum</b>	<b>Yozgat</b>	<b>Sivas</b>
Women	841	2.227	670	1184
Men	49	87	26	54
Children	72	98	86	161
TOTAL	962	2412	782	1399

Source: Ministry of Family and Social Services, 2020

### 8.3.12. Access to Infrastructure (Water, Sanitation and Road)

Infrastructure services, basically clean water, sanitation and road services are the main problems that prevent women's participation in socio-economic life. The interviews supported the official statistics and SESA surveys. Limited access to water increases the workload of rural women community members. Women complained about the stove heating system in their neighborhood. Especially rural roads - rather than highways - are unstable and women's access to district centers, education and health services is limited due to transport difficulties..

According to Community Level Survey (2020) , the main problems in the CPA is structures as follows:

- 1) Road related problems (58 respondents)
- 2) Limited drinking water (38respondents)
- 3) Electricity related problems (53 respondents)
- 4) no internet line (29 respondents)
- 5) transportation problem / no transportation (72 respondents)
- 6) no sewerage network (14respondents)

26% of muhtars mentioned that water resources were soiled in recent years. 25% stated that there are activities that cause pollution, such as untreated wastewater, soil fertilization, quarry operations, reduction of water resources. Most of them think that measures taken are not enough to prevent the water pollution.

According to Turkstat 2015 data, relevant statistics on infrastructure services can be seen below in Table 8-22.

The rate of utilizing waste services is high and similar in all four provinces. The rate of those who have problems with noise problemis highest in Yozgat. Tokat has the lowest rate of satisfaction with municipal cleaning activities.

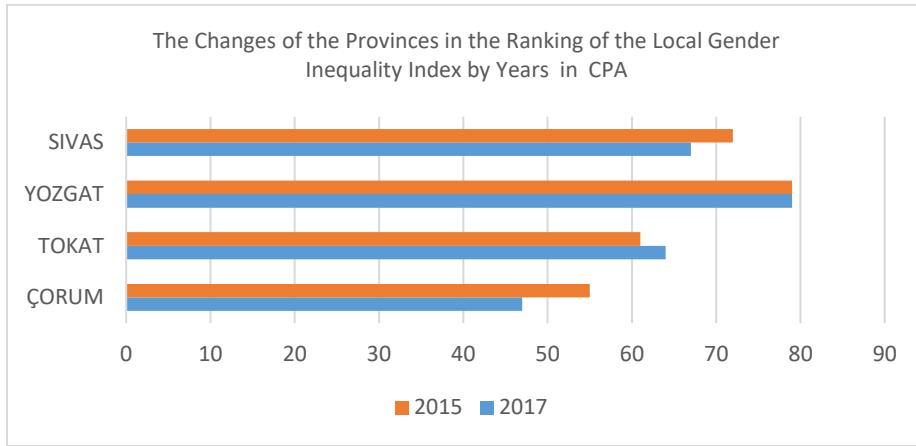
**Table 8-22 Statistics on Infrastructure Services**

	Rate of population receives waste services	Rate of people facing noiseproblem	Satisfaction level of municipal cleaning services	Sanitation and clean water access (%)	Satisfaction level of municipal transportation services
<b>Tokat</b>	73,6	12,3	61,7	70,9	65,1
<b>Yozgat</b>	70,6	14,2	72,1	70,2	57,0
<b>Çorum</b>	71,2	9,7	65,8	71,1	53,8
<b>Sivas</b>	73,1	13,2	75,7	72,9	65,3

Source: Turkstat, 2015

### 8.3.13. Decision Making Process

According to the Gender Inequality Index 2017 (Turkey) data, Çorum ranks 47th in ranking of Turkey's 81 provinces. Çorum is ahead in the ranking compared to the other three cities. At the same time, when we compare the index ranking with 2015 data, a positive development is observed in Çorum's ranking. Data on Yozgat's situation did not change during this period. Again, positive progress was observed for Sivas, while Tokat showed a negative change with its rising rank (see Figure 8-4)



**Figure 8-4 Changes in Ranking of the Local Gender Inequality Index by Years**

Source: (TESEV, 2018)

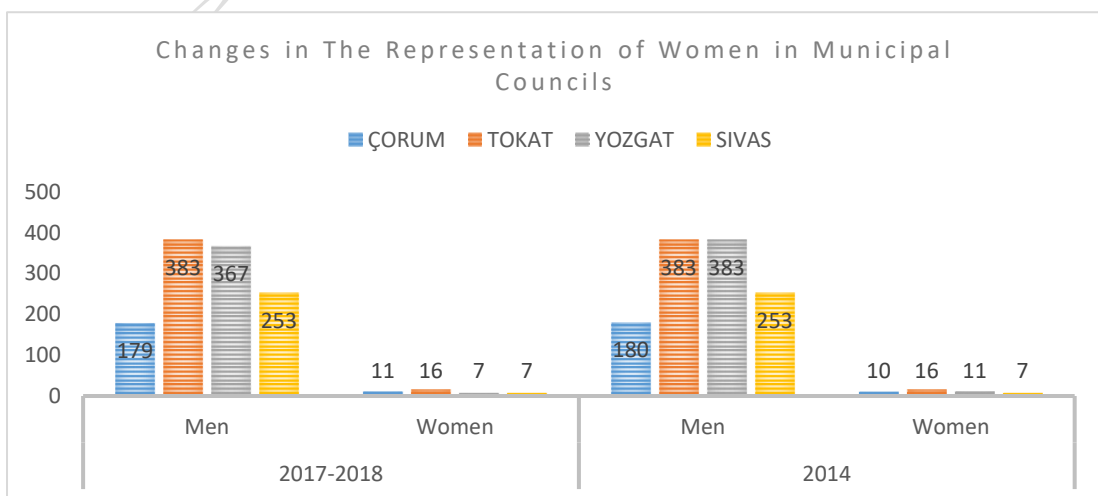
Although many efforts conducted to eradicate gender inequality, data about women’s involvement in the decision-making process should be improved.

An analysis of the number and ratios of women representatives in Municipal councils are structured as follows in Table 8-23.

**Table 8-23 Women’s Involvement in Decision-making**

TOKAT	Rate (%)
Ratio of Women in the Municipal Councils	4,01
YOZGAT	
Ratio of Women in the Municipal Councils	1,87
ÇORUM	
Ratio of Women in the Municipal Councils	5,79
SIVAS	
Ratio of Women in the Municipal Councils	2,69

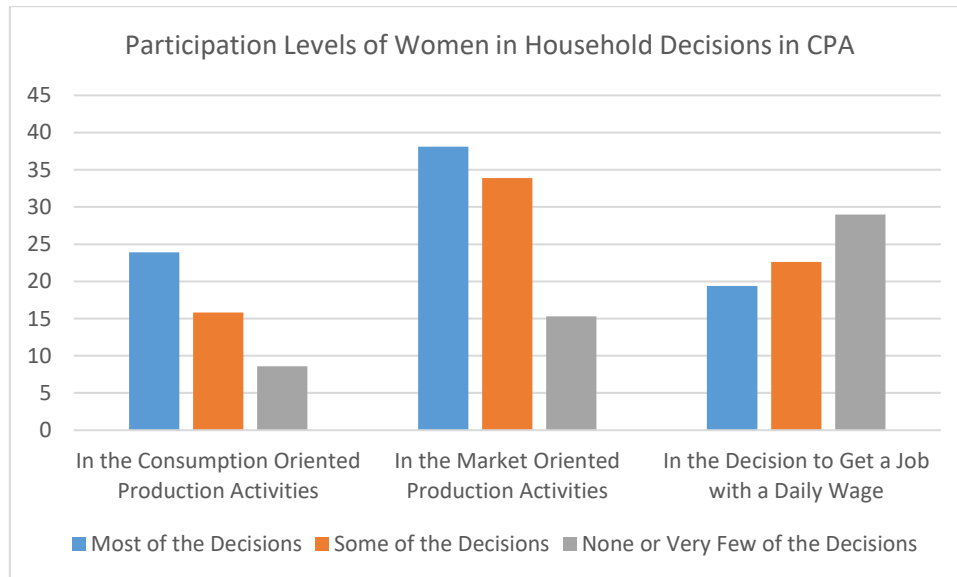
Source: TEPAV 2018



**Figure 8-5 Changes in The Representation of Women in Municipal Councils**

Source: (TEPAV 2018)

The participation of women living in the CPA in various decisions taken within the household was evaluated. This assessment mainly consisted of decisions regarding the production and labor force participation process. It is observed that women participate in most or some decisions regarding participation in agricultural activities both for consumption and for the market. However, the proportion of women who report little or no participation in the decision to get a job with a daily wage is high (29%) (see Figure 8-6)



**Figure 8-6 Participation Levels of Women in Household Decisions**

Source: Household Survey, Çekerek Project Area, 2020

In the households interviewed, 44,6% of the men stated that their wives were involved in most decisions regarding livestock activities. Participation of spouses in most decisions regarding non-agricultural activities is 19,5%.

Although there are regional differences in rural Turkey, there are similarities in some respects. In the past, economic decision-making power in rural areas generally belonged to the parents of the man, but it is observed in the project area that this situation changed with the rural transformation. The fact that it is an emigration region has notably accelerated this process. While the mother-in-law gains more status and power in the household as she gets older, nowadays it is seen that the mother-in-law has partially lost this power as young couples migrate to cities. Most of them struggle to survive as the only old woman left behind in rural areas. Male household members in the region predominantly have the final say in financial decisions such as the sale of land.

There are limited number of women Civil Society Organizations (CSOs) and they are usually located in district centers. Most of the CSOs working in women's rights and employment areas. The list of CSOs is as follows:

**Table 8-24 List of CSOs**

No	Area of Activity	Name	District
----	------------------	------	----------

1	Employment	Hitit Güneşi Kadın Girişimi Üretim ve Kalkınma Kooperatifi,	Merkez/ÇORUM
2	Employment	Puduhepa Kadın Girişimi Üretim ve Kalkınma Kooperatifi	Alaca, Boğazkale/ÇORUM
	Rights and Advocacy Associations	Seher Hanımlar Derneği	Merkez/SIVAS
	Employment	Çorum Business Women Association,	Merkez/ÇORUM
	Employment	Yozgat Women's Producer Association	Merkez/YOZGAT
	Women's Rights	Sivas Buruciye Sultan Kadınlar Derneği	Merkez/SIVAS
	Women's Rights	Tokat Kadın Platformu Dayanışma Derneği	Merkez/TOKAT
	Entrepreneurship	Bahadın Women's Association	Merkez/YOZGAT
	Entrepreneurship	Çekerek Women's Enterprise, Production and Management Cooperative	Çekerek/YOZGAT
	Entrepreneurship	Yeşilyurt Women's Enterprise and Management Cooperative	Yeşilyurt/TOKAT
	Entrepreneurship	Sulusaray Women's Enterprise, Production and Management Cooperative	Sulusaray/TOKAT
	Employment	Artova Women's Production and Management Cooperative	Artova/TOKAT
	Entrepreneurship	Yıldızeli Women's Enterprise, Production and Management Cooperative.	Yıldızeli/SIVAS

It has been observed that projects have been developed in women's associations and women's enterprise cooperatives, which have recently started operating in the Çekerek basin. At the same time, there are efforts to empower and employ women with the support of local governments.

In 2019, 200 women were trained within the scope of the worm composting project in 3 villages. Again, with the cooperation of women's associations and municipalities in the region, the local products production center project was carried out and attempts were made to ensure that women meet the market. In addition, it has been observed that the establishment of women's enterprise cooperatives is also supported by foreign funds. For example, a women's education center was established in Bahadın Town of the basin with the support of the Japanese embassy.

There are also women enterprise cooperatives in Aydıncık and Yıldızeli districts within the basin. In Aydıncık, women are engaged in local stone processing and production of local products through the cooperative.

Sub-projects' interest and consideration of women's needs, problems, coping strategies, and vulnerabilities should be considered. If sub-projects consider women's needs and challenges and give them a free place for decision-making, it may result in changes in the division of labor, new income areas, and participatory implementation.

#### 8.3.14. Social Life

Women mentioned that they couldn't fully involve in social life. The main reason is that limited social facilities. Lack of social facilities was stated by 130 of the key actor mukhtars interviewed. Most of the villages (74%) do not even have a grocery store for shopping. The

level of satisfaction with the social life and social relations of the region was evaluated at the provincial level.

Some statistics on social life can be seen below:

**Table 8-25 Statistics on Social Life**

	The number of cinema and theatre spectators	Satisfaction level of social relations	Satisfaction level of social life	Happiness level
Tokat	27,6	91,3	60,6	59,3
Yozgat	10,7	87,0	46,4	60,7
Çorum	32,3	90,5	45,3	56,6
Sivas	56,8	84,6	56,9	59,5

Source: Turkstat, 2015

Sivas is the province with the highest number of cinema and theater audiences. Although the level of satisfaction with social relations is similar in four provinces, the highest rate belongs to Tokat. The happiness rate gave a similar result in Tokat, Yozgat and Sivas provinces with a rate of approximately 60. This rate for Çorum is lower (56,6%) than the others (see Table 8-25).

As in many villages of Anatolia, women in CPA are deprived of many opportunities such as education and social rights. They seem to have no say in the house or outside. If they don't go to work in the field, at best they go out in front of the house or go to their neighbors' house. Although men traditionally gather in coffee houses and mosques, there is no place for women to come together and talk.

### 8.3.15. Control Over Sources and Land Ownership

Women's land ownership and access to natural sources are critical components of rural development. In the interviews with 177 Mukhtars, 13% stated that there are women without land in their villages. It is stated that the number of women who do not have land ownership in these villages is 448.

14 of the 44 women interviewed in the households declared that they have a decision on the land sales. On the other hand, 20% of the 222 men interviewed stated that their wives were also the decision-makers on land sales: Although a limited number of women are declared to have a say in purchasing, selling and renting land, it is seen that the land ownership and control within the region is dominated by men. This land ownership right and use is accepted by the majority of rural women. Generally, registered landowners are the husbands, brothers and fathers of the women.

Unequal land ownership and control is an important factor that negatively affects women's economic well-being, social standing and empowerment.

### 8.3.16. Gender-Related Division of Labor

Women and men community members have different roles and experience various aspects of agricultural production. Ignoring differential gender interests and needs would cause negatively affected production and loss of local knowledge. In agricultural activities, crop production and

animal husbandry are the main sources of income of the Project Area. Approximately 70% of the population of the region derives their livelihood from agricultural activities.

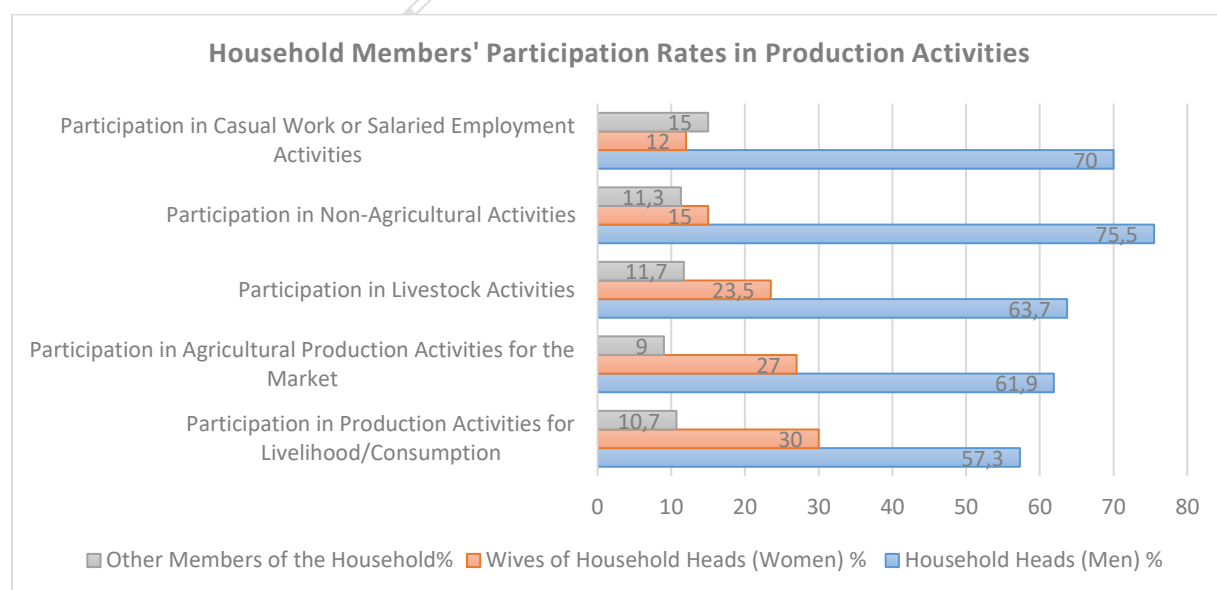
In the field study, it was observed that 52% of the 267 households participating in the household survey, carried out agricultural and horticultural activities for their own consumption in the last year. Male household heads in 57,7%, wives of household heads or female household heads in 30%, and other members of the household in 10,7% of these households are involved in the production for their own consumption (see Figure 8-7).

On the other hand, 70,78% of the households stated that they make agricultural production for the market. their participation in production activities is observed. (see Figure 8-7). Male household heads in 61,9%, wives of household heads or female household heads in 27%, and other members of the household in 9% of these households are involved in production activities (see Figure 8-7)

The rate of households engaged in livestock farming is 67%. Male household heads in 63,7%, wives of household heads or female household heads in 23,5%, and other members of the household in 11,7% of these households are involved in production activities (see Figure 8-7).

The participation rate of households in non-agricultural activities is 20%. Male household heads in 75,5%, wives of household heads or female household heads in 15%, and other members of the household in 11,3% of these households are involved in non-agricultural activities (see Figure 8-7).

Considering the casual working or salaried employment status of the households, it is seen that 15% of the households are included in this type of work. Male household heads in 70%, wives of household heads or female household heads in 12%, and other members of the household in 15% of these households are involved in non-agricultural activities (see Figure 8-7).



**Figure 8-7 Household Members' Participation Rates in Production Activities**

Source: Household Survey, Çekerek Project Area, 2020

Women and men have different roles and responsibilities during agricultural production. For example, women farmers are usually dealing with collecting, caring of plants while men farmers are dealing with marketing or women are responsible for all livestock – related activities (caring, milking, preparing of dairy products) except marketing. This kind of division of labor is directly related with the traditional gender roles and attitudes and strengthen women’s work burden.

#### **8.4. Key Gender Issues**

With reference to gender baseline, key gender issues for the CPA is structured as follows. It should be noted that impact issues may change for each sub-projects and development sectors.

##### **8.4.1. Inclusiveness of Vulnerable Women in the CPA**

Women community members, as a vulnerable group, are at the central of Project Area investments, and additional attention should be given to women having deeper vulnerabilities.

Women are among the groups most affected by unemployment, which is one of the leading socio-economic problems. The main reason for this situation is that women are in a lower social and economic position compared to men.

Not considering the differential women users would have resulted in lack of involvement of communities in the Project Area investments, limited benefitting from these investments, failure of gender equality policies and plans especially regarding basin management, lack of sustainability of sub-projects, increased workload and responsibilities of women and their loss of livelihood opportunities, breaking up of families, inequality in terms of access to land rights, property and credit during resettlement process and poverty of female-headed households. Additionally, ignoring disadvantaged women’s needs, problems, and voices in rural areas would have risks in terms of women’s limited participation and failure in considering inclusiveness (ICIMOD, 2000). Therefore, sub-projects were evaluated and ranked whether inclusiveness and participatory approach applied during their design and implementation and they cover all aspects of the rural women living in CPA.

##### **8.4.2. Women’s Access to Basic Services**

Access and benefit from basic services, especially education and health services, are the main issues in identifying rural women’s socio-economic conditions. Women’s involvement in agricultural production is an obstacle to enroll education services (TGNA, 2018). Most of the women living in the Project Area is graduated from primary and elementary schools.. Women’s enrollment in formal education and reducing illiteracy rate are key factors to empower women in the Project Area.

It is seen that the rate of women who have received primary school education in rural areas and the rate of women who have received secondary and high school education in urban areas is high. Since they are excluded from educational opportunities, women with a low level of education mostly work in the informal sector with low wages, without social security, temporary jobs or are unemployed.

Women face difficulties in accessing health and education facilities due to land structure, transportation difficulties, and climate. Additionally, women have obstacles to reach treatment services, especially for chronic diseases and disabilities.

Possible effects and pressure of the sub-projects on existing health services in the affected villages and the possibility of project-related effects on chronic diseases and/or existing health problems were assessed during SESA Process. Especially, construction-related impacts such as dust, noise, blasting (if any) and project worker's treatment needs in the construction side was considered.

#### **8.4.3. Women's Skill Development including Technology Usage**

Increasing vocational training opportunities has vital to empower women in socio-economic life (Kulak 2011 Aktaran Gazioğlu, 2014).

Attempts to design and develop effective employment opportunities for women who are among one of the most disadvantaged groups in Turkey's labor force are increased. It is important to include programs that will enable skills development and technology use in order to improve women's qualifications, increase their employability, reduce high female unemployment and improve their participation in employment, in the projects planned in the CPA.

Women are faced with the problem of time scarcity as they have to take care of the production in the field on the one hand, and the housework, child and elderly care on the other. Therefore, investments should be made in policies and technologies that will give free time to women.

In this respect, whether sub-projects include the possibility of learning and using new information and technology in women's income area was assessed during SESA Process. It is expected that especially agricultural and entrepreneurship related sub-projects have potential to include innovative and up-to-date trainings and approaches.

#### **8.4.4. Time Poverty**

The main findings show that while women's distribution of labor in economic activities is comparable to that of men, housework and care work are almost entirely the responsibility of women. Heavy burden of responsibility, women spend significantly less time compared to men.

Ignoring the differential gender roles and responsibilities sustains increased and/or continuing vulnerabilities of women, increased or existing domestic workloads, and few cash benefits for women (ICIMOD, 2000). Additionally, health risks due to workload would arise. If sub-projects provide an unequal and rigid gender division of labor, women would be paid less than men.

#### **8.4.5. Related Division of Labor**

Women and men community members have different roles and experience various aspects of agricultural production. Ignoring differential gender interests and needs would cause negatively affected production and loss of local knowledge.

Women and men have different roles and responsibilities during agricultural production. For example, women farmers are usually dealing with collecting, caring of plants while men farmers are dealing with marketing or women are responsible for all livestock – related activities (caring,

milking, preparing of dairy products) except marketing. This kind of division of labor is directly related with the traditional gender roles and attitudes and strengthen women's work burden.

Potential impacts of especially agriculture and forest related sub-projects were assessed during SESA process whether they re-produce gender division of labor or include innovative approaches to empower women's position in agricultural production.

#### **8.4.6. Promoting Women Entrepreneurs**

It is assumed that a need on meal, cleaning, raw material, equipment, accommodation etc. would be arisen in villages during construction works of gray investments. This would carry a positive impact on not only existing women-led enterprises in the villages but also women entrepreneurs who intend to establish a business in the basin. In addition, a specifically designed projects about such as agri food value chains and branding and marketing of agricultural products would increase the quality and number of female-led enterprises.

#### **8.4.7. Gender Based Violence**

Rural women have additional vulnerability against violence. It reduces their well-being and their ability to work and involvement in socio-economic life. Women cannot gain experience in financial management due to the constraints caused by the people in their household, and their knowledge and skills in managing money continues to be limited. This situation, as seen in the region, makes women dependent on other members of the household, especially men. In addition, the economic violence experienced creates stress related to poverty and financial uncertainties for the future, and negatively affects the mental and physical health of women. For this reason, economic empowerment should be considered as a process that increases the real power of women over economic decisions affecting their lives and priorities in society.

Empowering rural women economically would reduce their vulnerability to abuse. Provision of access to land, credit, and other resources and include rural women in decision making bodies would enable the empowerment of rural women. Economic development programs that encourage economic empowerment of women in rural areas where resources are limited, and projections aimed at reducing gender inequalities in access to credit and income will indirectly reduce the risk of women's economic violence.

Besides, in the context of this issue, the possibility of sub-projects having conflict factors were assessed during process. Especially, gray sub-projects includes construction works and the presence of construction workers in the communities may (theoretically) have potential to increase conflict and tension on rural women.

Besides, the sub-projects' possibility of having conflict factors were assessed during process. Especially, gray sub-projects includes construction works and the presence of construction workers in the communities may (theoretically) have potential to increase conflict and tension on rural women. Since the men of the family are responsible for the attitude and behavior of a woman, the presence of foreigners in the environment can also increase the pressure.

#### 8.4.8. Infrastructure Services

Women have difficulties in reaching infrastructure services due to conditions of their livelihoods. Additionally, women's limited access to infrastructure services would cause health problems and increase their workload. Impacts of sub-projects on the improvement of infrastructure services were assessed during the SESA process. The feasibility of road rehabilitation projects including rural and urban ones was considered to identify the projects' impacts on infrastructure. In addition to this, current and future infrastructure plans were requested from the relevant municipalities to identify future improvements on water, sanitation, and transportation services.

#### 8.4.9. Access and Control Over Sources and Land Ownership

Some of the most important consequences of not having property rights on registered land are:

- Limited access to credit
- Land insecurity that leads to vulnerability in the event of male migration, divorce or widowhood and unsafe access to food production;
- Reduced participation in land use decision-making and limited access to irrigation access to irrigation and extension services as well as other benefits from land ownership.

Differing access and control of various resources in the environment will have implications for affecting household livelihoods and unequal access and control resources. It causes women (or men) to play a less role in decision making, have lower self-esteem and status, and have unequal access to inputs such as knowledge, technology, education and limited land use.

At the same time, the positive results that can be achieved by women's land ownership;

- More ability to come out of situations where domestic violence occurs,
- Increased agricultural production and food security
- Increased bargaining power within the household, which is often allocating resources to children and better nutrition for the whole family.

### 8.5. Prioritization of Issues

Gender baseline was constructed and key issues were identified through a set of data collection tools. These tools are the Project related documents including Terms of Reference (TOR), desk review, household and community questionnaires, in-depth interviews with women, in-depth interviews with key informants, stakeholder meetings and mapping studies.

Table 8-26 Prioritization of Gender Issues

Priorities - ToR	Desk Review (Including PPlan and Policies)	Household and Community Questionnaires	In-Depth Interviews with Women	In-Depth Interviews with Key Informants	Stakeholder Meetings	Mapping Studies
Gender Based Violence	Gender Based Violence	Infrastructure – (Water, Sanitation, Road)	Infrastructure – (Water, Sanitation, Road)	Gender Based Violence	Infrastructure – (Water, Sanitation, Road)	Gender Based Violence
	Infrastructure (Water, Sanitation, Road)	Migration	Time Poverty	Women Entrepreneurship	Gender-Related Division of Labor	Infrastructure – (Water, Sanitation, Road)
	Time Poverty	Women's Visibility and Gender Awareness	Gender-Related Division of Labor	Access and Control Over Sources and Land Ownership	Women's Skill Development	Access and Control Over Sources and Land Ownership
	Gender-Related Division of Labor	Access to Basic Services (Education)	Access and Control Over Sources and Land Ownership	Access to Basic Services (Education)	Migration	Access to Basic Services (Education)
	Access and Control Over Sources and Land Ownership	Gender-Related Division of Labor	Access to Basic Services (Education)		Women's Visibility and Gender Awareness	Access to Basic Services (Health)
	Disadvantaged Groups of Rural Women	Access and Control Over Sources and Land Ownership	Access to Basic Services (Health)			Women's Participation in Decision Making Process
	Women Entrepreneurship	Role In Household Decision-Making Around Production And Income Generation	Disadvantaged Groups of Rural Women			
	Women's Skill Development	Access to Productive Capital	Women Entrepreneurship			
	Access to Basic Services (Education)	Access to Credit	Women's Skill Development			
	Access to Basic Services (Health)		Technology Usage			
	Technology Usage		Women's Involvement in Social Life			

The methodology of prioritization was explained in Section 8.2. In line with the findings the first five issues can be seen as below:

- Gender Based Violence (GBV)
- Women's Access to Basic Services
- Infrastructure Services – (Water, Sanitation, Road)
- Time Poverty
- Gender-Related Division of Labor
- Access and Control Over Sources and Land Ownership (to be handled in Resettlement Frameworks)

Impacts and magnitudes of prioritized issues are different for each sub-projects. A gender action plan should be conducted with the aim of identifying special needs and detailed situation of women during project design and operational phase. Please see Annex 6 for TOR for preparing Gender Action Plan.

## 9. SESA for TULIP for ÇEKEREK

### 9.1. Strategic Assessment

After an in-depth analysis conducted for the sub-projects proposed by the pertinent organizations for TULIP Çekerek landscape, sub-projects have been categorized under certain rationales with respect to inter-linkages within and among them for an integrated understanding. This understanding also helps analyse the relations between project groups of different rationales and how integrated the whole approaches of different institutions operating in different service areas but in the same landscape. Rationale categorizations is also helping in assessing the sub-projects' relevance as well as the area of intervention with the environmental and social prioritized issues of the Çekerek Project Area.

- Rationale 1: Improve resilience for control of floods, sedimentation and water erosion
- Rationale 2: Increasing livestock assets and related livelihood activities
- Rationale 3: Enhancing sustainable forests and forest-based livelihoods
- Rationale 4: Creating income generation by promoting tourism
- Rationale 5: Income generation by encouraging agricultural diversity
- Rationale 6: Expansion of irrigated farming

The rationales set above are assessed in this chapter in terms of:

- Coordination and Integration,
- Relevance to the environmental sensitivities and E&S priorities in the basin,
- Compatibility with social and environmental vulnerabilities,
- Climate resilience effect,
- Gender sensitivity context.

Assessment is made below as appropriate for each rationale in the following sections.

#### **9.1.1. Rationale 1: Improve resilience for control of floods, sedimentation and water erosion**

Sub-projects related to erosion, landslide and flood control structures are compiled under Rationale 1. Both OGM and DSI have sub-projects under this group. According to the legislation of both institutions, the intervention areas are different and are known to make complementary practices. Hence, coordinated and integrated planning would increase to achieve better results as a whole.

**Table 9-1 Projects Related to the Rationale 1**

Sub-Projects	Implementing Institutions
Mortared and non-mortared transverse structures (sills) in the lateral streams Dry wall thresholds Gully rehabilitation with wire mesh walls and mortar structures Soil Conservation Projects (9,000 ha) Erosion/Flood Control Projects (2,270 ha) Flood Control Projects (1,700 ha,)	OGM
Construction of flood and sedimentation control structure in Sivas, Karalar  Construction of flood and sedimentation control structures in Tokat for: Özderesi-Çime, Yeniköy-Kurt Creek, Kunduz-Karasu Creek  Construction of flood and sedimentation control structures in Yozgat for: Külekçi-Sarsak and Deve Creeks, Arpaç-Kavaklı and Hocanınpınar Creeks, Çandır-Kabak and Seynikkızıyunak Creeks, Çamsaray-Kuru Creek, Yelten-Seyhan Creek	DSI

### Relevance

Climate induced disasters (droughts, erosion and floods) which are as assessed in Chapter 6 and Chapter 7 are one of the focal environmental priorities that threaten livelihoods in general. Hence, sub-projects under Rationale 1 contribute to the protection of livelihoods while preventing and managing natural disasters. At the same time, these projects bring about measures for elimination of the indirect impacts on migration.

### Environmental and Social Sustainability

It is most likely that a large amount of aggregate material will be used during the construction phase of these control structures, which will put pressure on the quarries in the area. For sustainability concerns, the need for materials should be minimized by means of joint planning among institutions. In order mitigate possible impacts associated with quarries, institutions should ensure that licensed facilities are used and that preventive measures are taken against nuisance of noise and dust on nearby communities as well as other environmental control measures as necessary.

Given the similar flood control structures planned by OGM and DSI, the two organizations should cooperate to secure hydrological and ecological integration in each micro-catchment where the water structures will be located.

As for the operation stage, mitigation measures should include protection of the migrating fish species, critical aquatic wildlife and riparian ecology.

The subprojects could be more sustainable by ensuring:

- structures in/along river beds involve unrevealing green corridors at the river banks, helping improve the green infrastructure which also protects riparian ecosystems especially the riverine shores and edges of the streams;
- structures in/along the river beds designed to allow the movement of terrestrial and freshwater species and especially fish, with seasonal up and downstream migrations;
- mitigating cumulative environmental impacts regarding ecological (in particular the migrating fish, if any) and any impacts on downstream water rights;
- measures which mitigates possible adversely affects on daily life of local people such as transportation and access to small river side banks where vegetable planting is done
- measures taken such as utilization of specially rocks and stones accumulated in the river beds during the construction of large retaining walls in order to avoid additional environmental impacts with the use of stone quarries. Removal of rocks and stones will also mitigate any blockage on the river flow.

**9.1.2. Rationale 2: Increasing livestock assets and related livelihood activities**

Rationale 2 refers to projects that enhance livelihoods, including support for increased livestock assets and forest products, which eventually will help in issues such as preventing social conflicts and ensure integrated natural resource management planning.

It should be given particular concern that livestock breeding activities have high feed costs. Thereby rehabilitation and restoration of pasturelands is of great importance. Increasing pasture capacity will be key to sustainability of livestock region in CPA.

**Table 9-2 Projects related to Rationale 2**

Sub-projects	Implementing Agencies
Pasture Improvement Projects (2,976 ha)	OGM
Pasture Improvement Project (3 subprojects)	TRGM
Dairy Sheep Breeding Dairy Cattle Development	OGM
Improvement of Ovine Breeding Project (3 subprojects) Improvement of Dairy Cattle Breeding (2 sub-projects) Improvement of Cattle Breeding Barn Conditions Improvement Projects (2 sub-projects) Poultry Breeding Development Project (2 sub-projects)	TRGM

Pastures in CPA are weak in general, with low persistence and low yield. It will require about 5 years to reach high yields following rehabilitation works. Hence, there will be need for a significant time-period for providing access to the livestock planned to be distributed by grants.

An integrated perspective should be secured in order to plan for the fodder crops in the context of irrigation systems listed under Rationale 6. Thereby, DSI and TRGM should cooperate in planning for the livestock grants, complementary investments, extension services, etc.

### **Relevance**

Livestock is part of traditional life and common source of livelihoods in CPA as similar throughout the Central Anatolia landscape. For a farmer in Turkey, when unavoidable spending occurs, it can be sorted out by selling animals which would not have an impact on continuity of livestock. Farmers in the region also consider livestock breeding as the main income and aims to improve their income by developing production of dairy and meat products in the Project Area. Specifically, Yozgat is envisaged as a place for establishment of dairy and meat production facilities which would enable sustainability of animal husbandry at Çekerek Project Area. If only these reasons taken into account, as per the continuity of social life in the countryside, animal husbandry should be encouraged. Especially for the farmers having not enough arable land in CPA, the sub-projects under Rationale 2 will support the low income.

However, the young labour force has been migrating out for economic reasons, which makes it difficult for the elderly population to perform livestock breeding activities. While aiming to increase current livelihoods, it is anticipated that livestock grants will have a dual positive impact by reversing migration of young people.

The livestock supports should ensure high-yield breeds with high genetic ability and good breeding quality in good compatibility with the regional conditions.

Coordination should be established with the sub-projects related with rehabilitation of pasture assets, such that pasture areas are used more appropriately and effectively and making pasture-based breeding more profitable. In this respect, particular care should be given in geographical distribution of the livestock grants, in close vicinity to pasture lands.

In order to ensure sustainability of the livestock grants, farmers should be trained for modern business techniques at small family businesses.

As per poultry farming, there is a significant decrease in the number of chickens in the Project Area. It is assumed that the support of chicken and goose farms in Akdağmadeni which has the highest number of chicken and assumed to be center of egg poultry, and Çayıralan in Yozgat and 3 districts of Tokat will enable the development of alternative livelihoods, are associated with the social needs and sensitivities of the region.

### **Biodiversity concerns**

Rehabilitation of pastures should involve the conservation of any priority biodiversity feature (i.e. rare and threatened species) and critical habitats.

Pasture rehabilitation should include estimation of the carrying capacity of the pastures and seasonal and spatial planning of the types and numbers of livestock that would use the pasture. Intensive or even moderate fertilization and seeding of the pastures should be avoided, since this would disrupt the natural vegetation composition of the pasture and can be highly costly, unless deemed highly necessary.

### **Environmental Concerns**

Once the pastures are restored, there can be certain environmental concerns to be managed. Large amount of nitrogen excess and return of excreta-N at spots increases the risk of nitrogen losses to waterways and the atmosphere, particularly if intensive grazing is made. A good Pasture Management Plan is important in this respect, and should include optimizing fertilizer inputs, scheduling of crop rotations, scheduling of grazing periods, prevention of soil acidification and spread invasive species, etc.

### **Grants and Social Sustainability**

Grants should be managed with care, from planning to monitoring stages by implementing agencies (OGM and TRGM). Conflicts should be avoided, thereby objective criteria should be put in selecting beneficiaries. Grants should target the low-income groups and critically vulnerable individuals. Grant managers from both OGM and TRGM should avoid unjust selection of beneficiaries by setting and disclosing well-defined eligibility criteria and monitoring post-grant period.

Livestock should be monitored for at least five years after they are given; monitoring targets should be set by implementing agency.

### **Participatory Planning and Management**

Cooperation between institutions must be developed in order to plan and monitor pasture reclamation works in accordance with sustainable and restorative pasture management principles. For sustainable and restorative pasture management, the emphasis should be on erosion control in pasture reclamation efforts.

### **Gender Sensitivity**

Women are exposed to bigger work loads in all scales livestock activities, such as care and dairy works. Thereby, particular concern should be given to alleviating women's workload.

Women should be given priority in planning of activities, and should be consulted in all decision processes.

### 9.1.3. Rationale 3: Enhancing sustainable forests and forest-based livelihoods

OGM is an institution with a strong corporate background and legal frame, implementing an integrated approach aiming to sustain forests. To summarize interventions for Çekerek Project Area, OGM with Set 1 sub-projects, intends to improve its regional capacity in terms of physical abilities which will then lead to successful implementation for the forest maintenance activities as listed in Set 2. The Set 3 activities are designed to sustain the forests by mitigating the stress risk born as a result of human factor. Specific target for the Set 3 sub-projects is to generate alternative incomes to the forest villagers in order to avoid possible damages the forest to generate income. With 3 sets approach, the OGM creates a lifecycle of forest management as, (i) develop capacity of provincial organizations to intervene; (ii) implement forest maintenance, improvements and developments; (iii) protect the forest by generating alternative incomes to the forest villagers in order to mitigate the human born stress over forest (such as illegal cutting of trees for firewood, fire starting in forest to create agricultural land).

The three-step cycle is also well integrated between each other. The OGM is mobilizing the forest villages as the community labor force to be used during the Set 1 and Set 2 activities not only to develop belonging to the forest but also support alternate income which continues for a long period of time.

**Table 9-3 Projects related to 3rd Rationale**

Sub-Projects	Institution
Sub-Projects SET 1 Seedling Production Cushion for and Preparation of the Area (rehabilitation of drainage channels, irrigation, greenhouse, boom irrigation system, shading) Truffle Cultivation Greenhouse and Production and Maintenance of Truffle-Infused Seedlings;	OGM
Sub-Projects SET 2 Maintenance of Young Forests; Afforestation Projects (1,000 ha) Rehabilitation Projects (4,250 ha)	OGM
Sub-Projects SET 3 Solar Energy Water Heating Systems (975 pieces); Heat insulating and sheathing (558 pieces) Solid fuelled heating systems (921 pieces) Village Bakeries (70 units)	OGM
Sub-Projects SET 4 Honey Forests Projects Honey Forest Projects (107 ha) Professional Beekeeping and diversification of beekeeping product (461 households) Beekeeping and Bee Products Diversification Products (2 Sub-Projects)	OGM - TRGM

#### Relevance

Supporting the non-wood forest products and services sector and related secondary works to serve the protection of forests increases forestry activity. Forestry is one of the main livelihoods of the region therefore it should be noted that forest villagers are the beneficiaries when supporting non-forest products and services.

Beekeeping has a decreasing trend in CPA. By increasing the bee stocks in the region, more effective use of the existing beekeeping knowledge and experience can be achieved through the Project. Conversion of honey into value-added products and the ability to sell these products in remote markets will significantly contribute to the local economy. Farmer's training should be a part of the sub-projects related with beekeeping.

### **Biodiversity Concerns**

- Selection of areas for afforestation should take into account the potential presence of rare, threatened and endangered species and critical habitats, in order not to disturb or destroy these existing natural assets.
- Biodiversity surveys should be made in candidate areas, to determine the presence of such assets and if necessary to develop and implement suitable techniques for afforestation.
- Existing natural vegetation (trees, shrubs, herbs) should be conserved during afforestation.
- The extent of improvement of existing forest roads should be focused on sole purpose of enabling the forestry activities and not to increase reachability to forest areas for other purposes, as this would be contrary to the aim of protecting and sustainable use of forests.
- While planning and implementing the maintenance of young forests, existing tree diversity and natural vegetation should be conserved.

### **Sustainability**

OGM pays significant importance on giving local people a role in maintenance and conservation efforts for forests and providing satisfactory contributions to them has a positive impact on the protection of forests. Organizing activities in a way that does not interfere with the activities of local people and local corporate stakeholders contributes further to its sustainability.

- Poverty and lack of infrastructure in forest villages should also be considered as an important factor in regulatory and policy-oriented studies on the protection of forests.
- It is also important to develop marketing strategies by conducting value chain analysis in the planning and production of non-wood forest products. In this regard, effective cooperation of the forest and agriculture organization will increase the added value.

Sub-projects related to PV panels and solar heating systems are important for environmentally sound and climate friendly production and efficient use of energy. Use of PV panels will reduce the demand for firewood and contribute to the protection of forests in the long term.

### **Sustainability Concerns for Bee Keeping**

Besides being an economic income generating activity, beekeeping is an integral part of ecological balance. Therefore, this activity can be supported regardless of location.

During the implementation of the gray infrastructure investments, due to cumulative noise and dust, possible blocked roads and intense activity in forest areas may interrupt beekeepers.

As per the honey forests, selection of tree or shrub species to improve the honey production potentially endanger local species, thus prioritization of local and native tree species, instead of exotic ones should be taken into account. (i.e. *Robinia pseudoacacia*).

While establishing queen bee production, locally adapted honeybee races should be favored instead of transferring exotic races from a different region in Turkey, solely on the grounds of higher production. Locally adapted honeybee races are more resilient to local climatic conditions and variations than non-local ones. This would also serve to protect the locally adapted races, by avoiding unintentional genetic mixing.

### **Climate Resilience**

The effects of climate change should be evaluated in the selection of tree species, and accordingly, local tree species should be preferred. Due to climate change, suitability of the climatic conditions may decrease for certain tree species, hindering the expected benefits to be obtained from these activities. When planning income generating practices for the region, it is important that forest, agriculture and water resources are planned with a joint approach.

### **Gender Sensitivity**

Female beekeepers should be given priority. The problems and suggestions of experienced female beekeepers should be discussed in detail in the planning phase. Female beekeepers and women interested in beekeeping should participate in the subproject design phases as a stakeholder participation. The economic impact should also be measured by gender-based indicators.

It will be important to specify in employment plans and/or tender documents that women will be given priority and run securely. Flexible hours, safety measures and environmental regulations are implemented if necessary, for women to work comfortably during the implementation period. Monitoring and evaluation of activities should also be detailed with female-oriented indicators.

#### 9.1.4. Rationale 4: Creating income generation by promoting tourism

Coordination and integration between implementing institutions and other stakeholders is particularly important for planning tourism activities in the CPA. Provincial Directorate of Culture and Tourism should be involved in the planning process so that an appropriate and cohesive articulation can be ensured. From integrated planning point of view, nature tourism-based planning can be enhanced with a comprehensive approach to be developed while establishing tourism network infrastructure that also links cultural and natural attraction points in the region. This approach may also develop some solutions regarding infrastructure needs to be emerged (such as transportation, solid wastes and water-wastewater services) as a result of growing tourism.

**Table 9-4 Projects related to 4th Rationale**

Sub-projects	Institution
Çayıralan Ecotourism Management Plan and Route Study	OGM
Recreation area and picnic area projects (3 sub-projects)	OGM

#### Relevance

Given the low economic social and economic standards in the CPA, sub-projects that enable the development of alternative livelihoods is a significant planning intervention.

Apart from the income status, access to recreational facilities is conceived as a common need for the communities. The current situation related with social and cultural facilities was assessed during the community surveys where 23 muhtars out of 315 indicated lack of social facilities among the significant problems that need to be addressed. Hence, projects related to the improvement of current facilities and access to natural and cultural recreational facilities are important to the needs of the region. Given the low level of reference to tourism projects by muhtars, an awareness raising is required in order to ensure effectiveness of planned sub-projects, such that ecotourism and recreation areas can introduce a new income source.

Tourism is an area of activity that increases trade activities and make positive socio-economic contributions in the region. It is an economic sector that also would improve the job prospects of local people and also could reverse to an extent the ongoing trends of seasonal migrations to other parts of the country in search of job.

Population pressure that may occur on the infrastructure during the operation phase should be taken into account in the planning phase. The infrastructure needs of the recreation areas should be planned in a way that will not complicate the daily life of the local people. Environmental and social impact assessments should be conducted taking into account the issue of community health and safety.

The social sustainability of the project depends on availability and employment of young and qualified persons. Young population residing in other towns and cities can be encouraged to

migrate back for increased opportunities along with tourism investments. Training for qualified skills should be incorporated into the planning of the sub-projects.

**Environmental and Social Sustainability**

Intensive construction for facilities in these areas must be avoided or well-scheduled in order to prevent any nuisance and also conserve natural and cultural assets; while infrastructure should be planned as part of the tourism development in order to prevent any environmental pollution of waste and wastewater generation from tourism activities.

In order to prevent any damage on archaeological assets, prior approval should be granted from the Provincial Directorates of Culture and Tourism and this should be complemented with a well-established Chance Finds Procedure.

**Gender Sensitivity**

It will be important to prioritize female producers and female entrepreneurs in tourism activities. To encourage women in tourism activities, coordination should be established with municipalities such that women workers should be provided with transportation support in order to access these recreation and tourism facilities.

### 9.1.5. Rationale 5: Income-generation by encouraging agricultural diversity

#### Integration with DSI sub-projects

Management of water resources is particularly vital in increasing agricultural productivity and diversity. It is significant that DSI and TRGM cooperate and implement the projects listed under Rationale 5. Hence an integrated management perspective should be adopted by perceiving the links between the sub-projects. Reservoirs and water transmission lines planned by DSI will support TRGM's goals for increased agricultural diversity. Thereby, scheduling of TRGM activities should conform to the time lines related with completion of construction activities and start-up of operation. This time period until all irrigation infrastructure is in place should be well planned by TRGM in relation to timing of grants distribution and supports for new agro-products. Hence TRGM should not start distributing seeds and seedlings of new products before irrigation is secured, and should use the time period for analyzing farmer tendencies and well-planned agricultural extension services.

In planning the process of transition from dry to irrigated agriculture, extension role of TRGM will be required not only for training farmers for growing new types of crops but also on-farm irrigation systems i.e. irrigation tools and equipment, related agro-machinery, irrigation methods, daily scheduling of irrigation, etc.

Introducing of new crops should be based on assessment of local conditions, i.e. fodder plants where animal husbandry is supported and irrigation systems are in place.

Farmers' acceptability of introduced crops, affordability of associated costs (new machinery, fuel, maintenance, etc.) and availability of marketing channels should also be considered in planning of TRGM and OGM activities under Rationale 5.

#### Integration with OGM activities

Although sub-projects of TRGM are designed to support the basin in a cohesive way, better results can be achieved if integrated with OGM sub-projects. An integrated approach for implementation is proposed below in Table 9-5 for a complete agricultural value chain (including production, harvesting, processing and marketing), which could create better income for the vulnerable farmers, especially forest villages where income generation is more difficult than others.

For TRGM's sub-projects there exist a way of integration taking into account the value chain approach: Step 1 represents investing for production facilities such as greenhouses; Step 2 represents investments for new production techniques and crop types. The missing step is marketing investments including branding.

**Table 9-5 Projects related to 5th Rationale**

Sub-projects	Implementing Institutions
<b>STEP 1: Investment on production facilities</b> Greenhouse Cultivation (8 pieces) Greenhouse Cultivation (3 Sub-Projects)	OGM and TRGM

<p><b>STEP 2: Investments for new production techniques and crop types</b></p> <p>Truffle Mushroom Production (32ha)  Improvement of Mushroom Cultivation (79 pieces)  Dissemination of rose hip (600 ha)  Dissemination of Medicinal Aromatic Plant Production and operation facility projects (300 ha)  Lavender (6 pieces.30 decare)  Yield and Quality improvement project in Forage Crops Production  Fruit Garden Facility  Vineyard Facility  Land, yield and quality improvement in forage plant breeding  Fruit Scion Supply and Dissemination of Fruit Growing  Yield and Quality improvement project in Wheat Farming  Project for Increasing Yield and Quality of Barley Farming  Yield and Quality improvement project in Chickpea Farming  Dissemination of Potato and Union Production  Machinery Support for Good Agricultural Practices</p>	<p>OGM and TRGM</p>
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### STEP-1 Greenhouses

Environmental impacts should be taken into consideration for greenhouses. Impacts from the greenhouse installations would mainly include waste plastic covers and vegetable wastes. The plastic covers used in greenhouses are generally replaced every 3 years. Waste plastic covers should be recycled or sent to the landfill. Vegetable wastes can be considered as sub-products as long as they are free of other solid wastes. They can be used as food for livestock, however TRGM should ensure that they are traceable. Use of vegetable waste would reduce the cost of food for livestock.

Greenhouse is a labor intensive, capital intensive and knowledge-intensive agriculture activity. The knowledge of the local people about greenhouses is not sufficient, so the District Directorates of Agriculture and Forestry should organize trainings (extension activities) and monitoring programs related with greenhouses.

### STEP 2 - Mushroom, Medicinal Aromatic Plant (MAP), and Rosehip Cultivation

Given the limited alternative sources of income as one of the main socio-economic problems of the region, projects aimed at introducing alternative sources of income other than existing conventional activities constitutes a strong relevance to the Çekerek Project Area conditions.

Production of mushrooms, truffle, MAPs, and rosehip in small-scale do not pose significant environmental risks to the environment.

Although the region is suitable for these alternative products, their cultivation is a delicate production process. Thereby households will be supported with training especially focusing on the use of special equipment for production as well as extension services.

The farmers should be supported for developing rational and technology-wise marketing to be able to reach local and national market.

Irrigation needs should be evaluated in planning distribution of the greenhouse supports.

### **Gender Sensitivity**

It should be clear whether these activities are also specified as a demand or adopted by women. It is well known that agricultural production and related labor in the region are mainly carried out by women. Women farmers who are not registered in the national farmer registry system should be actively targeted to register and also be considered in the supports as to avoid any loss of government supports.

The project can be an opportunity for women's cooperatives and organizations. Detailed analyses should be discussed within the scope of gender action plan. Gender-based monitoring and evaluation indicators should be determined.

### **Sustainability**

Sustainability of the DSI sub-projects largely depend on farmers as the end-users of the irrigation systems as they will set the new crop patterns and associated methods of cultivation, irrigation, marketing. Thereby, DSI and TRGM should cooperate for an integrated approach in establishing systems for a resilient agriculture in the project area.

## 9.1.6. Rationale 6: Expansion of Irrigated Farming

**Table 9-6 Projects related to 6th Rationale**

Sub-projects	Institution
Construction of Irrigation transmission lines and back-up line for irrigation reservoirs of Artova, Ağmusa in Tokat	DSI
Construction of transmission lines for irrigation reservoir of Yukarı Karahacılı	
Construction of transmission lines for irrigation reservoir of Büyükmahal	
Construction of irrigation transmission lines and back-up lines for irrigation reservoirs of İbrahimköy,	
Sayitnizam, Kızılhamza	
Construction of Ağmusa Reservoir	
Construction of Yukarıhacılı Reservoir	
"Soil Analyses from us, Soil Protection from You" Project	TRGM

As integrated with Rationale 5 sub-projects, DSI and TRGM should coordinate for ensuring complementary agricultural extension activities including farmers trainings and demonstration activities.

Farmers' affordability of on-farm irrigation systems should be well-analysed as well. Grants can be extended to include on-farm irrigation systems in this respect.

### Relevance

CPA is a drought prone zone. Given the high risks of droughts in CPA, management of water resources is of particular importance for increasing agricultural productivity in the project area.

### Coordination

Construction of reservoirs and irrigation systems will require farmers to switch to a new agricultural pattern. The irrigated agriculture will impose farmer investments for on-farm irrigation equipment as well as new seeds, fertilizers, pesticides, etc. Farmers should be prepared for the process of transition to these changes in economic terms and also in organizational aspects such as water user associations and farmer cooperatives. A well-structured farmer extension programme should be established and implemented in all areas where irrigated agriculture is planned and is already taking place. Hence coordination should be commenced with TRGM for the timely introduction of the extension services and for new crops to be introduced through the Project. See Rationale 5 above for further details on the integration and holistic approach required for DSI and TRGM coordination.

### Social Conflicts

People living in the region to complain about the inadequacy of the irrigation water as they depend on the crop production to improve their living conditions. For almost 56% of people the main source of income was agricultural crop production, for almost 30% it was animal husbandry in Çekerek Project Area. In terms of social sensitivities, lack of irrigation water and

cultivation of low value products have been expressed as a problem in the settlements by 17% of muhtars in the community survey.

### **Environmental concerns**

Environmental concerns related with the reservoir projects are mainly related with the changes in the river water regime and associated ecology and biodiversity. Thereby, overall micro-catchment areas, including both the upland catchment areas and the catchment areas downstream should be considered in planning of water reservoirs.

Reservoirs change the water flow regime and therefore effect the aquatic biodiversity immensely. Aquatic biodiversity and especially benthic organisms in the rivers are extremely sensitive to water speed and primarily make their habitat choices according to water flow speed. The slightest change in water flow would alter the distribution and abundance of aquatic biodiversity. In addition to that, reservoirs change the chemistry of the water. As the running water of the river is slowed down in the reservoir, the aeration rate of the water diminishes, which in turn leads to decreased levels of dissolved oxygen, the necessary element to all forms of life. Natural stream purification processes also require adequate oxygen levels in order to provide for aerobic life forms. Therefore, cumulative impacts of planned reservoirs should take into account their effect on the water regime.

Apart from water regime, reservoirs create a barrier between upstream and downstream populations of aquatic species, including seasonally migrating fish. Fish passages can be built to diminish the effect of these barriers, however their effectiveness on the choice of the correct technology for the correct landscape and ecological processes, and the correct management style.

Through rise of water levels towards the neighboring natural areas of the water reservoirs, associated habitats and populations of species are lost. These habitats may contain critical habitats as well as rare, threatened and endangered species of flora and fauna. Therefore, biodiversity assessments should be made prior to planning of reservoirs and avoidance and mitigation measures must be determined and implemented.

### **Social concerns**

Social concerns with irrigation projects are mainly related with the downstream rights constrained by diversion of water through irrigation, reducing the water supply for downstream users, including communities and farmers and industries as well. Design and planning stage for reservoirs should give particular consideration on downstream user rights.

## 9.2. Mitigation Measures

Table 9-10 gives mitigation measures for each rationale and corresponding sub-projects discussed in the preceding section. Mitigations are geared to more sustainable, effective, environmentally sound and socially sensitive planning and implementation of the sub-projects.

As seen in the table, majority of the mitigations essentially depend on cooperation among the IAs and also with other government stakeholders in the project area. In this respect, the role of the Steering Committee would be very important to assure this coordination and cooperation in a timely and fluent manner.

Another significant point with the mitigation measures is the OHS context of employing forest villagers in the small construction works. Gaps in the legal frame related with this will largely be resolved with application of ESS 2 requirements, but the legal frame still needs to be considered to account for the labour conditions and OHS standards of forest villagers as the most vulnerable group in this aspect.

**Table 9-7 Mitigation Plan**

Rationale	Risks	Opportunities	Mitigation Measures	Budget for the Remedy Tool (To be financed from Component 2)	Responsible Party
<p>Rationale 1: Improve resilience for control of floods, sedimentation and water erosion</p>	<p>Extensive construction works will require use of quarries as associated with the sub-projects, which may impose additional environmental impacts.</p> <p>Construction works on streams may block fish migration routes, and may hinder water rights of downstream communities.</p>	<p>Given that the designs are at conceptual level for the flood control structures, there still exists possibility for improved and integrated designs. Through MCPs, prioritization and correlation of grey and green sub-projects may be achieved.</p>	<p>River beds will be cleaned of any residues from construction (i.e. rocks and stones) that can inhibit river flow.</p> <p>Residues can be used as aggregate material.</p> <p>Given the similar flood control structures planned by OGM and DSI, the two organizations should cooperate to secure hydrological and ecological integration in each micro-catchment where the water structures will be located.</p>	<p>No additional budget required from the Project.</p>	<p>DSI OGM TRGM</p>
<p>Rationale 2: Increasing livestock assets and related livelihood activities</p>	<p>Possible impacts are soil and groundwater contamination from increased livestock waste and increased load on the carrying</p>	<p>As Table 6.51 shows, 63% of the surveyed population feed their animals on pasturelands as compared with barns and other lands. Hence it can be assumed that the current</p>	<p>OGM and TRGM will ensure protection of the pasturelands against the future pressure from increased number of livestock.</p>	<p>Guidelines for Grazing Management Planning Guidelines for Grazing and Livestock Monitoring</p>	<p>OGM TRGM</p>

Rationale	Risks	Opportunities	Mitigation Measures	Budget for the Remedy Tool (To be financed from Component 2)	Responsible Party
	capacity of grazing lands.	grazing pressure on pastures are relatively small and pastures preserve their natural structure.	<p>OGM and TRGM will prevent social conflicts that may rise as a result of sharing scarce grazing resources</p> <p>OGM and TRGM will cooperate in order to prepare a Grazing Management Plan with a holistic approach and participatory decision making. The management plan will be inclusive of all grazing areas in the project area.</p> <p>OGM and TRGM will cooperate in order to monitor soil and groundwater quality to assess possible nitrate loads from grazing.</p>	<p>Baseline Surveys for each project site</p> <p>Grazing Management and Monitoring Plans, which defines at minimum:</p> <ul style="list-style-type: none"> <li>• grazing units and paddock designs,</li> <li>• Water access,</li> <li>• Livestock moves,</li> <li>• Pastoralists' mobility,</li> <li>• Herd sizes and numbers,</li> <li>• Vegetation cover and carrying capacity in different seasons with a sound forecast for climate change, <ul style="list-style-type: none"> <li>• Key protection areas (bio diversity)</li> <li>• Monitoring plan</li> </ul> </li> </ul> <p><b>Budget: 125.000 USD</b></p>	
Rationale 3: Enhancing sustainable forests and forest-based livelihoods	Mobilization of (forest and non-forest) villagers for community labor force to be used during particularly Set 2 activities may possibly	WB's ESS 2 defines the minimum conditions of all workers who will be mobilized during the activities financed by the project.	<p>OGM/TRGM will ensure full implementation of Labor Management Procedure (LMP) for the Project.</p> <p>OGM/TRGM will ensure that all sub-projects under the Rationale 3 will be supported</p>	BUDGET: Any type of labor mobilization conflicting ESS 2 shall be upgraded to desired standards as defined in the mitigation box. Thus a financial gap in order to obey defined standards while contracting and	OGM TRGM

Rationale	Risks	Opportunities	Mitigation Measures	Budget for the Remedy Tool (To be financed from Component 2)	Responsible Party
	<p>impose occupational hazards and traffic accidents during travel to-and-from forest areas.</p> <p>The national legislation of OGM and TRGM for contracting (forest and non-forest) villagers as workers fail to assure securing social security status of the employees.</p> <p>OGM and TRGM fail to impose occupational health and safety measures during working on sites when mobilize (forest and non-forest) villagers as workers.</p>	<p>Application of ESS 2 will contribute highly to increased health and safety conditions of village workers.</p> <p>Application of ESS 2 may indirectly lead to review and improvement of the national legal frame in relation to all activities of OGM/TRGM that use labor force from forest /non-forest communities.</p>	<p>with project-specific Labour Management Procedure in compliance with the LMP, comprising in particular, of:</p> <ul style="list-style-type: none"> <li>• Age and Social Security verification system for the employment procedure</li> <li>• Obligatory OHS Trainings</li> <li>• Monitoring visits to project sites</li> <li>• Workers Grievance Mechanism</li> <li>• OHS compliant work sites</li> </ul>	<p>employment will be financed by the Loan.</p>	

Rationale	Risks	Opportunities	Mitigation Measures	Budget for the Remedy Tool (To be financed from Component 2)	Responsible Party
Rationale 4: Creating income generation by promoting tourism	Economic benefits from the tourism activities will be at risk unless linked with all tourism activities in the overall project area.	The project area can be considered to be rich in cultural and natural spots of attraction, which imposes a high potential of tourism activity.	<p>Waste and wastewater management requirements should be well planned in coordination with concerned local authorities.</p> <p>Once the exact locations of sub-project activities are selected, approval should be secured from the Directorates of Culture and Tourism in the provinces.</p> <p>A detailed Chance Finds Procedure should be set and implemented.</p> <p>An awareness raising and training programme should be prepared for encouraging local businesses in eco-tourism activities.</p>	No additional budget required from the Project.	OGM Provincial Directorates of Culture and Tourism
Rationale 5: Income generation by encouraging agricultural diversity	Villagers may lack knowledge on new crops that will be newly introduced.	Introduction of new farming practices such as greenhouses and mushroom cultivation will eventually relieve the burden on forests.	TRGM will cooperate with DSI in relation with the timelines of completion of irrigation systems and will plan for extension services	<p>No additional budget required from the Project.</p> <p>Additional grants for the on-farm irrigation systems: <b>200.000 USD</b></p>	DSI OGM TRGM

Rationale	Risks	Opportunities	Mitigation Measures	Budget for the Remedy Tool (To be financed from Component 2)	Responsible Party
			<p>and on-farm systems accordingly.</p> <p>TRGM and OGM will assess the farmer needs and tendencies for affordability of on-farm irrigation systems, and will extend the scope of grants accordingly.</p> <p>OGM will cooperate with TRGM during planning stage for applying the value chain approach.</p> <p>OGM will ensure joint implementation in order to achieve sustainability of its sub-projects under this rationale.</p> <p><b>TRGM will prepare Pasture Management Plans for each pasture rehabilitation project.</b></p>		
Rationale 6: Expansion of irrigated farming	Farmers may lack the knowledge on the new crop pattern to be introduced along with irrigation systems	Pressurized irrigation system distributed through closed channels will provide sustainable use of water and soil resources.	A well-structured Agricultural Extension Programme should be planned and implemented by TRGM, including cultivation	MCPs shall be prepared in a manner to address the defined mitigation methods	DSI TRGM OGM

Rationale	Risks	Opportunities	Mitigation Measures	Budget for the Remedy Tool (To be financed from Component 2)	Responsible Party
	<p>and associated cultivation practices.</p> <p>Pressurized irrigation systems will impose power costs for pumping water.</p> <p>Dam safety risks associated with the height of the reservoirs.</p>		<p>methods, on-farm irrigation methods, marketing, cooperatives, water use associations, etc.</p> <p>Affordability of pumping costs and on-farm irrigation equipment and sustenance of the whole irrigation system should be considered.</p> <p>Water-user associations should be established in advance of full implementation of irrigation projects.</p> <p>Dam safety procedure to be executed as relevant to the final design of the reservoirs.</p> <p>DSI will prepare and implement site specific ESA documents (such as ESMP, ESIA, RPs, etc) for its sub-projects.</p> <p>DSI will ensure that water reservoirs will be designed to allow for migration of fish in the tributaries. Detailed</p>		

Rationale	Risks	Opportunities	Mitigation Measures	Budget for the Remedy Tool (To be financed from Component 2)	Responsible Party
			<p>ecosystem surveys will be performed for aquatic ecosystem in the area of influence.</p> <p>DSI will perform hydrological modelling study in order to assess and mitigate the impacts of water reservoirs on downstream communities.</p>		

Implementation budget for the above mitigation plan is presented below:

**Table 9-8 SESA Implementation Budget**

Description	Indicative Costs (USD)
ESS Instruments to be outsourced for Çekerek Project Area (ESIA/ESMP Documents, additional planning and assessment works, GIS applications, field surveys, etc)	250,000
Additional management plans for CPA	100,000
Additional Grants for On-Farm Irrigation Systems	200,000
Grazing Management and Monitoring Plan	125,000
Total	675,000

Preparation of the Extension Program and its implementation will be planned and budgeted under the micro-catchment plans.

Mitigation measures are included in the sub-project designs, hence no additional costs are envisaged. Project-specific Management Plans and ESS instruments will be prepared by implementing authorities.

## 10. CUMULATIVE IMPACT ASSESSMENT

Cumulative Impact Assessment is based on an approach of “Valued Ecosystem Components” defined as environmental and social issues that are considered to be important in assessing risks, and they may be physical features, habitats, wildlife populations, ecosystem services, natural processes, social conditions and cultural aspects.

Considering the environmental and social impacts of the Project, the VECs are listed against the Project to check whether they are prone to cumulative impacts. By considering this list, the impacts evaluated with the terms “negligible” or “minor” as the outcome of environmental and social impact assessment are scoped out from the CIA study. Furthermore, priority is given to those VECs that are likely to be at the greatest risk from the Project’s contribution to cumulative impacts.

Table 10-1 scopes out the VECs with negligible/minor impacts and positive impacts. It should be underlined that only the VECs affected from the Project are considered in the assessment. In other words, any VEC that would be affected by other developments, but not by the Project are not taken into account in the CIA.

For the initial identification of VECs, the following key ES issues have been considered:

- Soil quality
- Groundwater quality
- Downstream water rights
- Surface water quality
- Terrestrial biodiversity
- Riparian ecosystems
- Aquatic biodiversity
- Air quality
- Environmental Noise
- Cultural heritage
- Community health and safety
- Livelihoods

The projects that are considered in scoping and their status as scoped in and scoped out are provided in Table 10-1 below. Other facilities can be any major activities in the basin. The impact of any activity is taken into consideration if it has joint impacts in the impact area of a sub-project. For instance, sub-projects may have soil contamination risks in their immediate footprint of activity, where estimated impact of any other activity in the vicinity would be negligible. The resulting cumulative impact would be negligible, despite the moderate to high risks depending on the sub-project and its specific location.

**Table 10-1 Scoping of VECs**

<b>VECs</b>	<b>Area of Influence</b>	<b>Impact significance of Project</b>	<b>Estimated impact significance of other facilities</b>	<b>Scoped in / Scoped out</b>
Soil quality	Footprint of the sub-projects and close environs	Negligible	Negligible	Scoped out
Groundwater quality	No direct impacts	Moderate	Negligible	Scoped out
Downstream water rights	Micro-catchments	Moderate	Moderate	Scoped in
Surface water quality	Creeks and tributaries all in the project area	Negligible	Moderate	Scoped out
Terrestrial biodiversity	Critical habitats	Negligible	Negligible	Scoped out
Riparian ecosystems	Sub-project footprint and environs	Negligible	Negligible	Scoped out
Aquatic biodiversity	Micro-catchments	Moderate	Negligible	Scoped in
Air quality	Settlements in the vicinity of construction activities	Negligible	Negligible	Scoped out
Environmental Noise	Settlements in the vicinity of construction activities	Negligible	Negligible	Scoped out
Cultural heritage	Footprint of sub-projects	Negligible	Negligible	Scoped out
Community HS	Downstream of reservoirs	Moderate	Moderate	Scoped in
Livelihoods	All throughout the CPA	Moderate	Negligible	Scoped out

As seen in Table 10-1, VECs scoped in the cumulative assessment are downstream water rights, aquatic biodiversity, and community health and safety as associated with the two reservoirs planned. Impact area for a cumulative impact on downstream water rights can be seen in the two separate micro-catchments as existing dam facilities are located in proximity to the planned reservoirs. There are no other facilities with common impacts on common impact zones.

For the characterization of the existing conditions of the selected VECs, the main reference is the baseline section. Baseline conditions for the selected VECs are reiterated in Table 10-2, with a view to cumulative impacts from other activities in the same area of influence of a sub-project.

**Table 10-2 Baseline Status of VECs**

VECs	Baseline status
<b>Downstream Water Rights</b>	<p>Ağmusa and Yukarı Karahacılı reservoirs will provide communities water for irrigation only. Reduced river flow may cause reduced water for downstream farmers.</p> <p>See Figure 10-1 for the location of the reservoirs. Ağmusa reservoir may add to the impacts of Artova and Alpu dam reservoirs. Yukarı Karahacılı reservoir is planned in a separate catchment where Süreyyabey dam is currently operational and may add to the impacts of the dam in terms of downstream water rights.</p> <p>DSI plans its water structures with due consideration on water rights of existing structures as well as community rights.</p>
<b>Aquatic biodiversity</b>	<p>No known critical species are present in the tributaries where both reservoirs are planned. Aquatic species should be further assessed in terms of critical species and migrating fish species in particular.</p>
<b>Community Health and Safety</b>	<p>Overflow from the reservoirs would pose risks on downstream people and properties, particularly in case of flash floods as well as dam failures.</p>

Significance of predicted cumulative impacts are estimated in terms of the vulnerability and/or risk to the sustainability of the VECs assessed, which are directly related with the existing sensitivity/vulnerability conditions of the VECs and the applicable thresholds that are the limits beyond which changes resulting from cumulative impacts become of concern.

Management strategies are suggested for any cumulative impacts that are anticipated to be significant. Management approaches for the estimated cumulative impacts are presented in Table 10-3 below.

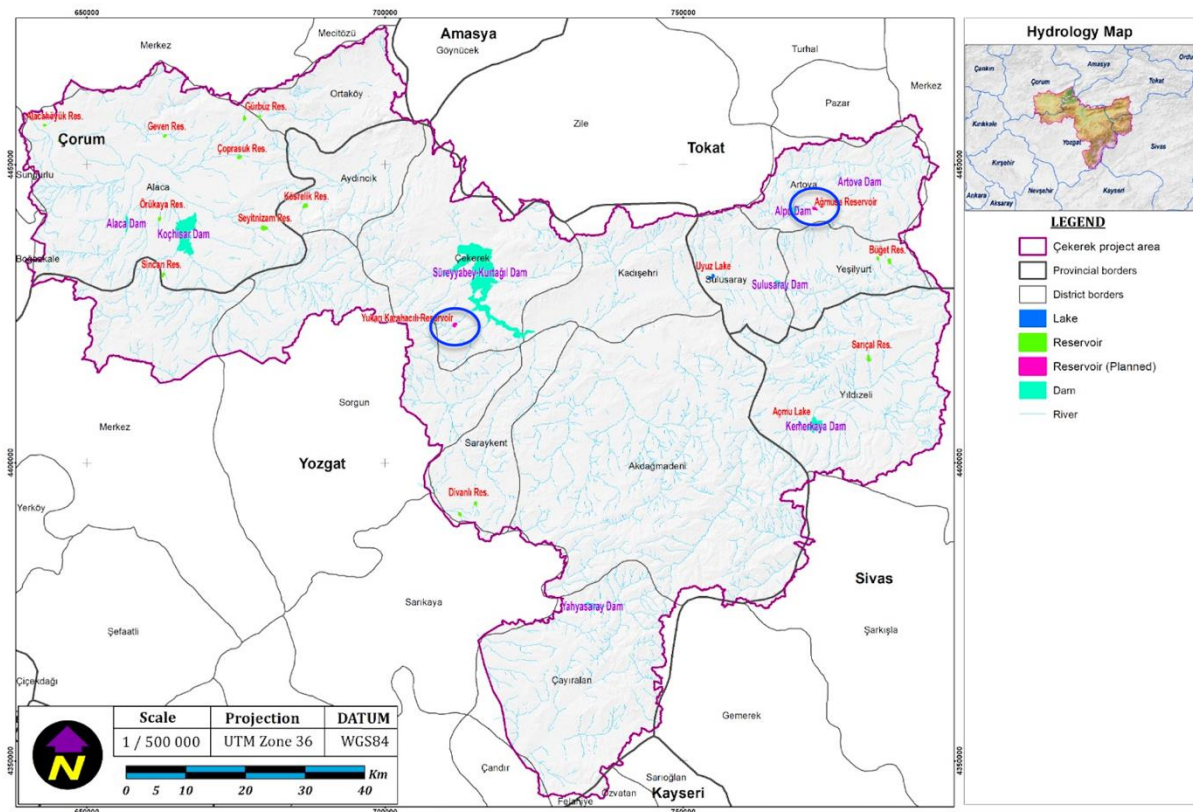


Figure 10-1 Sub-basins for Possible Cumulative Impacts

Table 10-3 Management Approaches for Cumulative Impacts

VECs	Impacts	Management approach
<b>Downstream Water Rights</b>	<p>Impacts on downstream communities due to decreased river flow, possibly for irrigation and recreational purposes.</p> <p>DSI plans a minimum environmental flow of 10% of the average of last 10 years flow rates back as of the design year but should be verified with minimum ecological flow and downstream water requirements</p>	<ul style="list-style-type: none"> <li>Community consultations and grievance mechanism should be implemented in order to be aware of any insufficient environmental flow and downstream water uses.</li> <li>Geographical boundaries of the grievance mechanism should be inclusive of downstream water users.</li> <li>Flow rate should be regularly monitored, downstream of the planned particularly reservoirs.</li> <li>Mitigation measures provided in Table 9.7 for Rationale 6 should be implemented</li> </ul>
<b>Aquatic biodiversity</b>	<p>Insufficient and/or modified flow of the river due to the reservoirs may impede the movement of migratory fish and reduce their ability to complete their lifecycle. Migratory fish species may start to decline.</p>	<ul style="list-style-type: none"> <li>Hydrobiological assessment should be conducted for both reservoirs with a cumulative impacts perspective at the stage of environmental and social assessment.</li> <li>Hydrobiological monitoring should be performed with due concern on migrating species.</li> </ul>

VECs	Impacts	Management approach
<b>Community Health and Safety</b>	Communities will be imposed to a range of risks; mainly: dam failure risks and overflow during flash floods, which may cause property damages and loss of people's lives.	<ul style="list-style-type: none"> <li>• Mitigation measures provided in Table 9.7 for Rationale 6 should be implemented</li> <li>• DSI should assess cumulative impacts of dam failure cases</li> <li>• DSI should prepare sub-basin specific emergency preparedness and response plans considering cumulative impacts of overflow and dam failure.</li> <li>• Mitigation measures provided in Table 9.7 for Rationale 6 should be implemented</li> </ul>

## 11. CONCLUSION

Climate resilience is driving concern for a series of investments in CPA, underlined by drought and soil erosion that impose impacts on the regional socio-economic status. Çekerek basin presents an exemplary case for identifying the vulnerabilities over a landscape mainly defined by the catchment area of Çekerek River.

The SESA process provides a participatory assessment for the prioritization of environmental and social issues in the basin, which enables decision makers to assess relevance and sustainability of the proposed actions in responding to the immediate and long-term needs of basin-wide communities. Outcomes of stakeholder engagement are supported and verified by mapping and GIS applications that support planners and decision-makers with data and tools presented in the SESA Report.

Investments planned by three major government organizations (DSI, OGM and TRGM) put the efforts to respond to the obvious problems and issues encountered at local level.

Mitigation measures in response to investments are mainly related with ensuring coordination and cooperation between implementing partners as well as other primary stakeholders, hence adaptation to and mitigating climate change necessitates a holistic approach of the different institutions working in a harmonized manner.

Another key element of the mitigation measures is comprised of a broad range of farmer trainings to be structured within the scope of a full-fledged Extension Program. The Extension Program should be commenced before implementation of pertinent sub-projects so that farmers are prepared for transition to new agricultural practices. The Extension Programme should be comprehensive to include on-farm equipment needs, organizational aspects (i.e. water-user associations); needs for use of appropriate seeds, pesticides, fertilizers; irrigation techniques, etc.

It is important to incorporate the recommended mitigation measures into the implementation of Environmental and Social Management Plans for sub-projects.

As a whole, the SESA for Çekerek Project Area presents another pilot case, after the SESA for Bolaman Basin, for all implementing authorities working under the umbrella of an overall project in a harmonized and integrated manner for disseminating the methodology, participatory processes and lessons learned in other basins with landscapes confronting climate resilience issues.

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## **ANNEXES**

Annex-1: Brief Description of Sub-Projects

Annex-2: First and second round data request list

Annex-3: List of Pasture Assessts

Annex-4: Çekerek Scoping Field Study Programme and Participation Lists

Annex-5: Field Study Photolog

Annex-6: Terms of Reference for Gender Action Plan

Annex-7: Assessment Procedure for Designating Critical Habitats

Annex-8: Cultural Heritage List