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ÇINAR
ENGINEERING
CONSULTANCY INC.

YOZGAT AND SİVAS PROVINCES IRRIGATION AND FLOOD SEDIMENT CONTROL PROJECTS

KÖSRELİK POND IRRIGATION SUPPLY PROJECT

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN
CNR-PLN-TULIP-KSR-ESMP-001

March 2025
(Final Draft)

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%	percent
°C	Celsius degree
µg	microgram
AFAD	Disaster and Emergency Management Presidency
AoI	Area of Influence
APV	Air Pollution Contribution Value
BRB	Bolaman River Basin
BSA	Biodiversity Study Area
CBD	Convention on Biological Diversity
CFP	Chance Find Procedure
CHS	Community Health and Safety
ÇINAR or Consultant	Çınar Engineering Consultancy Inc.
CITES	Convention on International Trade in Endangered Species of Wild Flora & Fauna
CO	Carbon Monoxide
CoC	Code of Conduct
CORINE	Coordination of Information on the Environment
CSMP	Camp Site Management Plan
dBA or dB(A)	decibel A
DLP	Defect Liability Period
DSI	State Hydraulic Works
EBRD	European Bank for Reconstruction and Development
E&S	Environmental and Social
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EPM	Integrated Landscape Management
EPPO	European and Mediterranean Plant Protection Organization
EPRP	Emergency Preparedness and Response Plan
EPSA	Ex-Post Social Audit
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESHS	Environmental, Social and Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Monitoring Report

ESMS	Environmental and Social Management System
ESS	Environmental and Social Standard
EU	European Union
EUNIS	European Nature Information System
FI	Financial Intermediary
GBV	Gender-based Violence
GDoM	General Directorate of Meteorology
GEF	Global Environment Fund
GHG	Greenhouse Gas
GISD	Global Invasive Species Database
GISP	Global Invasive Species Programme
GM	Grievance Mechanism
GRIIS	Global Register of Introduced and Invasive Species
GRS	Grievance Redress Service
H&S	Health and Safety
ha	hectare
hm^3	cubic hectometers
hm^3/year	cubic hectometers per year
IAS	Invasive Alien Species
IBA	Important Bird and Biodiversity Area
ILMP	Integrated Landscape Management Plan
ILO	International Labour Organisation
IO	Implementing Organization
IPA	Important Plant Area
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
kg	kilogram
kg/day	Kilogram per day
kg/h or kg/hour	kilogram per hour
KGM	General Directorate of Highways
km	kilometer
l	liter
LC	Least Concern
LM	Labor Management
LMP	Labor Management Procedure
LRP	Livelihood Restoration Plan
m	meter
m/s^2	meters per second squared

m^2	square meter
m^3/day	cubic meters per day
m^3/year	cubic meters per year
MAF	Ministry of Agriculture and Forestry
MCP	Micro Catchment Plan
mm	millimeter
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MSDS	Material Safety Data Sheet
NE	Not Evaluated
NGO	Non-Governmental Organization
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NT	Near Threatened
OGM	General Directorate of Forestry
OHS	Occupational Health and Safety
PCM	Public Consultation Meeting
PGA	Peak Ground Acceleration
PIU	Project Implementation Unit
PM	Particulate Matter
PPE	Personal Protective Equipment
RCA	Root Cause Analysis
RoCIAP	Regulation on Control of Industrial Air Pollution
RP	Resettlement Plan
SEA	Sexual Exploitation and Abuse
SEF	Stakeholder Engagement Framework
SEP	Stakeholder Engagement Plan
SH	Sexual Harassment
SO_2	Sulfur Dioxide
TMO	Turkish Grain Board
TMP	Traffic Management Plan
TR	Turkish Republic
TRGM	General Directorate of Agricultural Reform
TULIP	Türkiye Resilient Landscape Integration Project
TurkStat	Turkish Statistical Institution
UN	United Nations
DVIG	Disadvantaged/Vulnerable Individuals/Groups
VU	Vulnerable

WAP	Worker Accommodation Plan
WB	World Bank
WBG	World Bank Group
WMP	Waste Management Plan
WWTP	Wastewater Treatment Plant
YRB	Yeşilırmak River Basin

EXECUTIVE SUMMARY

Türkiye is particularly susceptible to drought disasters, soil erosion, land degradation, and desertification due to its arid and semi-arid climate. Despite afforestation efforts since the 1970s, approximately half of Türkiye's forest land remains degraded, necessitating rehabilitation. In response to these challenges, the Türkiye Resilient Landscape Integration Project (TULIP) is proposed, with support from the World Bank (WB), aiming to address environmental and social (E&S) challenges in selected river basins. Specifically, TULIP focuses on the Bolaman Basin in the Eastern Black Sea region and the Çekerek Basin in Central Anatolia.

Within this ESMP, it is aimed at ensuring that all risks and adverse impacts of the Project activities are considered, and the most appropriate mitigation and monitoring measures are proposed as required by the Turkish national legislation and the WB Environmental and Social Standards (ESSs), as well as TULIP Environmental and Social Management Framework (ESMF).

The ESMP encompasses various chapters, including project description, legal and policy frameworks, assessment methodologies, environmental and social baselines, risks and impacts identification, mitigation measures, monitoring plans, institutional arrangements, stakeholder engagement and grievance mechanism. This comprehensive framework ensures systematic management of environmental, health, safety, and social risks throughout project phases.

TULIP entails several subcomponents assigned to different government bodies. Consequently, on September 27, 2023, a contract was executed between the DSI, Department of Survey, Planning, and Allocations, and Çınar Engineering Consultancy Inc. (ÇINAR or Environmental and Social Consultant). This agreement aimed to facilitate the preparation of environmental and social documentation, including the Environmental and Social Management Plan (ESMP), Resettlement Plan or Ex-Post Social Audit (RP/EPSA), and Stakeholder Engagement Plan (SEP) reports. These documents are intended for the Yozgat and Sivas Provinces Irrigation and Flood Sediment Control Projects, covering subcomponents 1.2.(a).(ii) and 1.2.(a).(iii) in the Çekerek Basin.

This ESMP has been prepared for the sub-project of "***Kösrelik Pond Irrigation Supply Project***" (hereinafter referred to as "the Project") which is within the borders of Aydıncık District of Yozgat Province.

The Project aims to provide irrigation to the agricultural fields near the Kösrelik Pond, which is under construction. The Kösrelik Pond, which is being constructed on the Özdere Stream within the borders of Aydıncık district in Yozgat Province, is intended to irrigate the agricultural lands located in Kösrelik Village, Kocabekir, and Mercimekören villages in Aydıncık district of Yozgat and Körpınar village in Alaca district of Çorum. The Project is located in the Central Anatolia Region, within the borders of the 14th Yeşilırmak Basin, situated on the Özdere Stream at an elevation of 885.00 meters above sea level. The Kösrelik Pond is located 1.2 km northwest of Kösrelik Village, 89 km from Yozgat province, and 9 km from Aydıncık district. In the current situation, Kösrelik Pond construction work has already achieved 20% physical progress. The Project will be realized along with the construction of Kösrelik Pond construction phase.

Within the scope of the Project, it is planned to complete the construction works of a total of 23,225 m of irrigation network, including a main (transmission) pipeline with a length of 6,220 m, a total of 15,905 m of backup and tertiary pipelines, and a total of 1,200 m of discharge pipelines. The material of the pipes will be High-Density Polyethylene (HDPE). In the current situation, the irrigation pipelines have been started to be installed with the national budget,

however, it could not be completed. Within the scope of the Project, it is planned to complete the irrigation supply pipeline network. The details regarding the existing and planned pipeline lengths are given in the relevant sections of the document.

The associated facilities of the Project are the Kösrelik Pond itself, the material quarries (F-1 Permeable Material Quarry, K-1 Rock Material Quarry and Limestone Material Quarry) which are used for the construction of the Kösrelik Pond. The EIA Not Required decisions for the quarries were obtained (Appendix-1).

Within the scope of the Project, it is envisaged that a total of 20 personnel will work during the construction phase. After the construction phase is completed, the operation of the irrigation facility is transferred to the irrigation unions, and the irrigation union is required to employ regular personnel. Although it has not yet been determined which irrigation union will take over the operation of the project, it is estimated that 5 people will be employed during the operation phase by the union. The maintenance and repair of the irrigation facility will be the responsibility of the irrigation union to which the Project is transferred.

The estimated duration is 18 months to complete the construction activities of the Project, and there will be a Defect Liability Period (DLP) of 18 months afterwards.

The Project will be realized and operated in line with the following: (i) the national legislation; (ii) World Bank's (WB) Environmental and Social Framework (ESF); (iii) Environmental and Social Standards (ESSs) except ESS7 and ESS9 which are not applicable to the Project; (iv) Environment, Health and Safety (EHS) Guidelines; and (v) TULIP's ESMF.

After the assessment of the potential environmental and social (E&S) impacts of the Project activities, the environmental and social risk category of the Project has been determined as **Moderate Risk.**

The Project activities will be performed mostly on agricultural land and village roads. The project area is located among Kösrelik, Kocabekir, and Mercimekören villages of Aydıncık/Yozgat and Körpınar village of Alaca/Çorum. For privately owned agricultural lands, expropriation processes will be conducted. This issue will be examined separately in the Resettlement Plan (RP) and under Section 7.3.1.

The risks of earthquakes, landslides, rock falls and avalanches in the region are determined as low. The most common type of disaster in the province is flood and inundation.

There are no legally protected areas or Key Biodiversity Areas (KBAs) within the project area and its vicinity. Therefore, there is no trigger regarding habitat. No endemic species have been identified among the species recorded.

There are no historically or archeologically protected areas within the Project area and its vicinity to be affected by the Project activities.

The environmental and social impacts addressed within the ESMP, along with the key mitigation measures, are summarized in Table 1.

Table 1. Potential E&S Impacts and General Mitigation Measures

Potential E&S Impacts	General Mitigation Measures
Air Quality	Regular maintenance of machinery and equipment. Water spraying for dust prevention. Consultation with stakeholders and planning construction activities during periods that will result in least disturbance.
Community Health, Safety and Security	Surrounding work areas with barriers/fences. Hiring security personnel. Hanging warning signs. Compliance with traffic rules and speed limits.

Potential E&S Impacts	General Mitigation Measures
	Consultations with stakeholders and planning construction activities during periods that will result in least disturbance.
Land Acquisition	Implementing Resettlement Plan (RP). Ensuring full compensation for the PAP. Consultation with the landowners, and implementation of Grievance Mechanism (GM) effectively.
Labor and Working Conditions	Implementing Labor Management Plan. Providing transparent, non-discriminatory, equal recruitment opportunities with respect to ethnicity, religion, language, gender and sexuality. Providing trainings on environment, social, occupational health and safety, labor, Code of Conduct, GM, gender-based violence (GBV) and sexual exploitation and abuse and sexual harassment (SEA/SH). Implementation of Grievance Mechanism. Proper adaptation of human rights policy and labor rights.
Noise Generation	Consultations with stakeholders and planning construction activities during periods that will result in least disturbance. Regular maintenance of machinery and equipment.
Occupational Health and Safety	Surrounding work areas with barriers. Ensuring that the use of construction equipment is carried out by certified personnel. Hanging warning signs. Ensuring that personnel use personal protective equipment. Safe working procedures. Equipment maintenance.
Stakeholder Engagement and Grievance Mechanism	Consultation with stakeholders. Implementation of GM.
Waste Management	Implementation of Waste Management Plan. Compliance with the waste management hierarchy. Collection and disposal of the waste separately. Use of hazardous and non-hazardous waste storage areas. Recycling/disposal of waste by licensed companies. Keeping the project area clean during construction works and maintenance activities during operation.
Water Use and Wastewater Management	Preventing unnecessary water use. Collection of wastewaters in an impermeable septic tank and ensuring it is treated by licensed wastewater treatment plants.
Cultural Heritage	Implementation of Chance Find Procedure in case of encountering any chance find.

The DSI Project Implementation Unit (PIU) has the overall responsibility of the implementation of this ESMP. Besides, the Contractor (or Maintenance/Repair Contractor) is responsible for the implementation of all mitigation measures and monitoring activities. Monitoring and supervision activities of the implementation and compliance to the ESMP will be performed by the PIU team formed within the DSI Regional Directorates (DSI Regional PIU) and by the specialists appointed by Project Coordination Unit (PCU). The details regarding the site visits and reporting requirements are given in Section 10.4 of the document.

Moreover, a Stakeholder Engagement Plan (SEP) detailing the stakeholder identification, engagement activities and grievance mechanism, etc. of the Project have been prepared separately and summarized in this plan in Chapter 11.

1 INTRODUCTION

In Türkiye, rapid population growth, urbanization, industrialization, natural disasters, and climate change pose risks that are harming the country's natural resources and environment. Due to the dominance of arid and semi-arid climate characteristics, Türkiye is particularly vulnerable to drought disasters. Soil erosion, land degradation, and desertification are among the most severe environmental issues faced by the country. The combination of geographical, topographic, climatic, and soil characteristics makes Türkiye more prone to soil erosion.

Since the 1970s, afforestation efforts have been made in Türkiye to prevent and reduce erosion. Despite a significant increase in forest cover as a result of these efforts, about half of Türkiye 's 22.34 million hectares of forest land has been classified as degraded and in need of rehabilitation.

The planned project aims to develop and implement an integrated landscape management approach in a selected number of sub-basins, defined by a combination of challenges commonly faced by many underdeveloped rural areas in Türkiye's river basins.

Türkiye Resilient Landscape Integration Project (TULIP) is a project set to be carried out with the financial support of a World Bank (WB) loan, developed with the Ministry of Agriculture and Forestry (MAF), General Directorate of Forestry (OGM) to support Türkiye for addressing environmental and social (E&S) challenges in the Bolaman Basin (in the Eastern Black Sea region) and the Çekerek Basin (in the Central Anatolia region).

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. 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. Within the scope of Sub-component 1.2 Resilient Grey Infrastructure of TULIP, which is explained in Section 1.3, DSI is the main implementing agency.

This Environmental and Social Management Plan (ESMP) has been developed for the sub-project under the scope of TULIP, which is called "**Kösrelik Pond Irrigation Supply Project**".

1.1 Objectives

The primary objective of TULIP is to enhance the livelihood security and resilience of local communities against climate-related risks and impacts such as landslides, floods, and droughts in Türkiye.

To achieve its goals, TULIP will adopt an integrated landscape management approach in the target basins. This approach will leverage the past experiences of the Turkish Republic (TR) and the WB in basin rehabilitation. The project envisions a participatory planning process that considers the contributions of different stakeholder groups, coordinating and integrating solution proposals among various public institutions, state, and local stakeholders.

The aim of the project development is to strengthen integrated landscape management, thereby increasing access for rural communities in the targeted regions of Türkiye to diverse livelihood opportunities and resilient infrastructure services. This approach not only

addresses environmental challenges but also aims to improve socio-economic conditions for the local populations[1].

Within the scope of the Project, the objective is to complete the closed irrigation system of the agricultural lands located in Kösrelik, Kocabekir and Mercimekören villages in Aydıncık district of Yozgat province and Körpınar village in Alaca district of Çorum province from Kösrelik Pond, which is being built on Özdere Stream within the borders of Aydıncık district of Yozgat province.

Within this ESMP, it is aimed at ensuring that all risks and adverse impacts of the Project activities are considered, and the most appropriate mitigation and monitoring measures are proposed as required by the Turkish national legislation and the WB Environmental and Social Standards (ESSs), as well as TULIP Environmental and Social Management Framework (ESMF).

1.2 Scope

This ESMP has been developed to ensure the effective management of all the environmental, health and safety and social risks and impacts, which may arise due to the Project activities during the preconstruction, construction and/or operation phases. It includes the following chapters and contents:

- ***Introduction:*** The objectives, scope, and project background and rationale have been given in this chapter.
- ***Project Description:*** Specific objectives, location, components and technical characteristics, associated facilities, labor demands and timeline of the Project have been presented in this chapter.
- ***Legal and Policy Framework:*** The national legal framework, international policies and standards and Project standards have been defined and identified in this chapter.
- ***Assessment Methodology:*** The methodology of the environmental and social assessment of the potential adverse risks and impacts of the Project has been explained in this chapter.
- ***Environmental Baseline of the Project:*** Baseline information on the environmental conditions of the Project area and its surroundings, which are geographical location, land use, topography, soil quality, geology, water resources, hydrology, seismicity, natural disaster potential, climate, air quality, noise, existing sanitary infrastructure and biodiversity, have been presented in this chapter.
- ***Social Baseline of the Project:*** Baseline information on the social conditions of the Project area and its surroundings, which are population, demography, sensitive receptors (vulnerable/disadvantaged individuals/groups), livelihood and employment, existing social infrastructure (education and health services, traffic and transportation) and cultural heritage, have been presented in this chapter.
- ***Environmental and Social Risks and Impacts:*** The environmental and social area of influence has been defined, and expected environmental and social risks and impacts in each of the Project phases have been identified in this chapter.
- ***Environmental and Social Mitigation Measures:*** In this chapter, mitigation, minimization and/or compensation measures have been determined for each of the identified risks/impacts for all phases of the Project.

[1] OGM – TULIP Environmental and Social Framework available at: https://www.ogm.gov.tr/tulip/cevresel-sosyal-yonetim-cercevesi/cevresel-ve-sosyal-yonetim-cercevesi

- ***Environmental and Social Monitoring Plan:*** In this chapter, monitoring requirements such as parameters, locations, methods, frequencies, etc. have been determined for each of the mitigation measures for all phases of the Project.
- ***Institutional Arrangements:*** In this chapter, existing institutional structure and capacity have been defined, roles and responsibilities for the implementation of ESMP have been determined, capacity development and training requirements, environmental and social reporting and disclosure of the ESMP have been presented.
- ***Stakeholder Engagement and Grievance Mechanism:*** Previous stakeholder engagement and consultation activities and grievance mechanisms (current mechanisms, national-, WB- and Project-level grievance mechanisms) have been summarized in this chapter.

1.3 Project Background and Rationale

As stipulated in the Eleventh Development Plan (2019-2023) of the TR, which was prepared by the Presidency of Strategy and Budget and came into effect on 18.07.2019 with Decision No. 1225, Türkiye is among the countries that will be adversely affected by climate change due to its geographical location. This situation exacerbates sudden rainfall, floods, and drought disasters. Türkiye places great importance on progressing towards sustainable and inclusive growth. In order to achieve effective use and conservation of water resources, river basin management plans, sectoral water allocation plans, basin master plans, drought management plans, flood management plans, and action plans for the protection of drinking water basins will be completed for 25 basins. In addition, the Eleventh Development Plan of Türkiye emphasizes the protection of the environment. The aim is to protect and enhance the quality of environmental and natural resources, ensure effective, integrated, and sustainable management, and promote environmentally friendly practices, particularly in water basins and all areas.

The Bolaman River Basin in the Eastern Black Sea Region, the Çekerek River Basin in the Central Anatolia Region, and the Yeşilırmak River Basin in the Western Black Sea Region are among the regions significantly affected by landslides, floods, and the degradation of natural resources. These basins face specific issues, including soil erosion, degradation of forest ecosystems, surface water pollution, landslides, drought, and floods. The Yeşilırmak River, which flows through the provinces of Amasya, Tokat, and Samsun, is particularly vulnerable to these environmental issues due to its geographical and climatic conditions.

To address these issues, the OGM under the MAF has initiated the preparation of an integrated project and explored various financing options. As a result of these efforts, OGM, in collaboration with the Ministry of Treasury and Finance, has decided to seek financial support from the WB [2].

TULIP has been developed with WB coordinated by OGM under MAF, and it involves collaboration with the General Directorate of Agricultural Reform (TRGM), the State Hydraulic Works (DSI), and the General Directorate of Highways (KGM), which is affiliated with the Ministry of Transport and Infrastructure, aiming to address the environmental and socio-economic issues encountered in the Bolaman Basin and Çekerek Basin.

The components and subcomponents of TULIP has been formed to cover the Bolaman, Çekerek and Yeşilırmak basins, consisting of two main components, which are integrated green and gray infrastructure solutions to reduce landslide, flood and drought risks in the region and increase the resilience of local people and natural resources. The main components of TULIP are as below:

Component 1: Investments in Resilient Landscape Integration Target Areas

Under the first component of TULIP, the following green and gray infrastructure measures are intended to be financed:

- Conduction small-scale erosion, sedimentation, and flood control works by rehabilitating forest and pasture areas,
- Implementing sustainable climate-smart agricultural practices and operationalizing value chains,

[2] TULIP Webpage, About Project, available at: https://www.ogm.gov.tr/tulip/Sayfalar/Hakkinda.aspx#tab-1

- Carrying out activities for diversifying livelihoods,
- Developing resilient infrastructure systems for water supply, irrigation facilities, as well as flood, landslide, and sediment control,
- Constructing and repairing rural road networks to make them resilient to climate and disasters.

Component 2: Implementation Framework, Project Management and Sustainability

This component aims to strengthen capacity and coordination among TULIP Implementing Agencies to ensure effective and efficient project implementation and establish sustainable institutional structures and processes that will support integrated landscape planning and management both at the project site and elsewhere. The project's Integrated Landscape Management (EPM) model will enable scale-up, adaptation, and resilience to other vulnerable rural areas, as well as large-scale job creation and post-pandemic recovery in as sustainable a way as possible.

Moreover, all components and subcomponents of TULIP can be seen in Table 1-1 together with implementing organization and relevant basins.

Table 1-1. Components and Subcomponents of TULIP[3]

Project Components	Implementing Organization (IO)	Basin
Component 1: Investments in Resilient Landscape Integration Target Areas		
Subcomponent 1.1. Green Infrastructure and Sustainable Livelihoods		
(a) Upper catchment forest landscape and livelihoods		
(i) Small scale erosion, landslide and flood control works	OGM	Bolaman
(ii) Rehabilitation and sustainable management of forests		
(iii) Rehabilitation and sustainable management of forests and pastures		Çekerek
(iv) Income Generation and Livelihood Diversification for Forest Villages		
(b) Sustainable agriculture and value chains		
(i) Climate-smart and sustainable agricultural practices	TRGM	Bolaman
(ii) Climate-smart and sustainable agricultural practices		
(iii) Income generation and diversification of livelihoods for rural areas		Çekerek
Subcomponent 1.2. Resilient Gray Infrastructure		
(a) Resilient infrastructure for water security		
(i) Dams and multi-purpose small-scale reservoirs	DSI	Bolaman
(ii) Irrigation works		Çekerek
(iii) Flood and sedimentation control structures		
(b) Resilient transportation		

[3] TULIP Environmental and Social Framework available at: https://www.ogm.gov.tr/tulip/cevresel-sosyal-yonetim-cercevesi/cevresel-ve-sosyal-yonetim-cercevesi

Project Components	Implementing Organization (IO)	Basin
(i) Resilient rural road rehabilitation	KGM	Bolaman
Component 2: Implementation Framework, Project Management and Sustainability		
Subcomponent 2.1. Institutional Framework for Integrated Landscape Management		
(i) Support in creating the application framework	OGM	
(ii) Technical assistance on the development of guidelines to support the implementation of the national strategy for landscape resilience		
(iii) Support for the development of ILMPs and MCPs for BRB and CRB		
(iv) Capacity-building and awareness raising		
Subcomponent 2.2. Project management and sustainability		
(i) Strengthening capacity for daily project management	OGM	
(ii) Environmental and social risk management		
(iii) Complaint mechanism, citizen participation and communication		
(iv) Monitoring and evaluation		

As seen in the table above, TULIP has various subcomponents to be implemented by various governmental organizations. Accordingly, a contract was signed on September 27, 2023, between DSI, Department of Survey, Planning and Allocations, and Çınar Engineering Consultancy Inc. (ÇINAR or Environmental and Social Consultant), for conducting the work on the preparation of the environmental and social documents (Environmental and Social Management Plan (ESMP), Resettlement Plan or Ex-Post Social Audit (RP/EPSA) and Stakeholder Engagement Plan (SEP) reports) for the Yozgat and Sivas Provinces Irrigation and Flood Sediment Control Projects, which covers the subcomponents 1.2.(a).(ii) and 1.2.(a).(iii) in Çekerek Basin. In this Project is under the category of "1.2.(a).(ii). Irrigation works".

Yozgat and Sivas Provinces Irrigation and Flood Sediment Control Projects include the following six sub-projects presented in Table 1-2.

Table 1-2. Sub-projects under Yozgat and Sivas Provinces Irrigation and Flood Sediment Control Projects[4]

No	Name of the Sub-project	District / Province
1	Kösrelik Pond Irrigation Supply Project	Aydıncık / Yozgat
2	Külekçi Village- Sarsak and Deve Streams Flood and Sediment Control Project	Çayıralan / Yozgat
3	Arpaç Village- Kavaklı and Hocanınpınar Streams Flood and Sediment Control Project	Çekerek / Yozgat
4	Çamsaray Village- Kuru Creek Flood Control Project	Kadışehri / Yozgat
5	Yelten Village-Seyhan Stream and Its Tributary (Kirazlı Creek) Flood and Sediment Control Project	Kadışehri / Yozgat

[4] **Source:** Preparation of WB Environmental and Social Documents for Irrigation and Flood Sediment Control Projects in Yozgat and Sivas Provinces – Inception Report, November 2023

No	Name of the Sub-project	District / Province
6	Kadıköy Flood and Sediment Control Project	Yıldızeli / Sivas

This ESMP has been prepared for the sub-project of ***"Kösrelik Pond Irrigation Supply Project"*** (hereinafter referred to as "the Project") which is mostly within the borders of Aydıncık District of Yozgat Province and Alaca District of Çorum Province. The details regarding the Project are given in the following chapter.

2 PROJECT DESCRIPTION

In this chapter of the ESMP, Kösrelik Pond Irrigation Supply Project (the Project) has been described with its objectives, location, components, technical characteristics, associated facilities, labor demands and timeline.

2.1 Specific Objectives of the Project

Within the scope of the Project, it is aimed to complete the closed irrigation system of the agricultural lands located in Kösrelik, Kocabekir and Mercimekören villages in Aydıncık district of Yozgat province and Körpınar village in Alaca district of Çorum province from Kösrelik Pond, which is being built on Özdere Stream within the borders of Aydıncık district of Yozgat province. In other words, the Kösrelik Pond is located within the borders of Aydıncık, Yozgat, while the irrigation system within the scope of the Project covers three (3) villages from Aydıncık district of Yozgat province (Kösrelik, Kocabekir and Mercimekören) and one (1) village from Alaca district of Çorum province (Körpınar).

Table 2-1. Project Location

Project Component	District/Province	Villages
Kösrelik Pond*	Aydıncık/Yozgat	Kösrelik
Irrigation System	Alaca/Çorum	Körpınar
	Aydıncık/Yozgat	Kösrelik
		Kocabekir
		Mercimekören

* When the project area is examined through Google Earth Pro application, Kösrelik Pond is located within the borders of Alaca district Çorum province and according to the national General Directorate of Land Registry and Cadastre data set, it is within the borders of Aydıncık district of Yozgat province.

With this Project, 597 hectares of gross agricultural land will be irrigated via sprinkler, drip and release systems by transporting the water taken from Kösrelik Pond by means of gravity to the irrigation area with a system of pressurized HDPE pipes.

2.2 Project Location

The Project area is in Aydıncık district in Yozgat province and Alaca district of Çorum province and within the borders of the 14th Yeşilırmak Basin. The irrigation area which will be resulted in after the Project realization will cover the agricultural lands in Kösrelik village, Kocabekir village and Mercimekören village in Aydıncık district of Yozgat province and Körpınar village in Alaca District of Çorum province. The Kösrelik Pond is being built within the borders of Aydıncık District, Yozgat (please also see Table 2-1).

The Project activities will be performed on the agricultural lands and existing roads. The Project location map showing the Project area, area of influence, irrigation lines and Kösrelik Pond has been given in Figure 2-1[5].

The area of influence and distances to the closest sensitive receptors have been detailed in Section 7.1 in the ESMP.

[5] ESRI World Image, Satellite Image

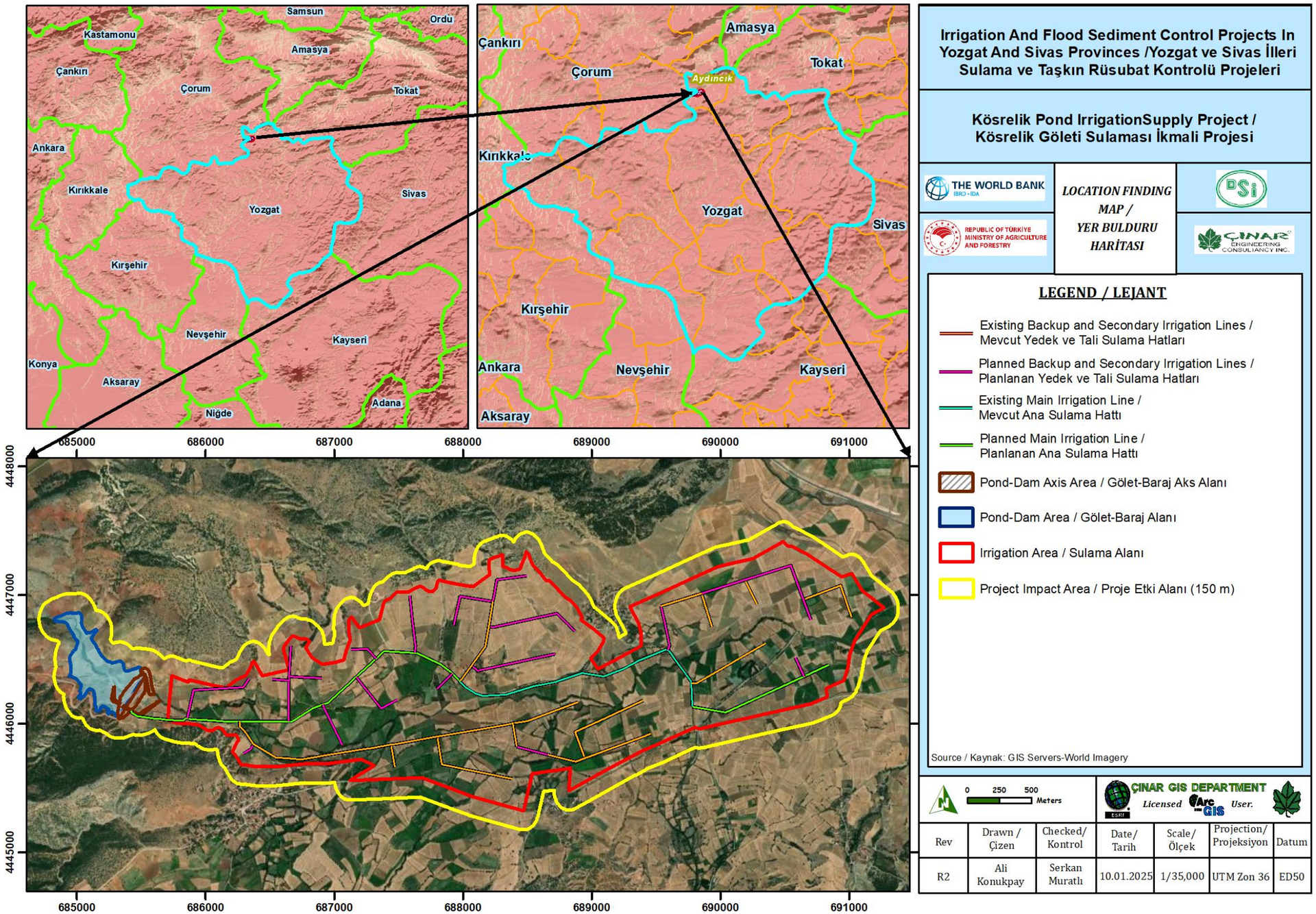

Figure 2-1. Project Location Map[5]

2.3 Project Components and Technical Characteristics

The Project covers the irrigation network with the sprinkler, dripping and release systems for the agricultural lands with the water taken from Kösrelik Pond which is under construction. The general information regarding the irrigation network and irrigation area are summarized in Table 2-2, and the details for the completion of the pipelines are given in Table 2-3.

Table 2-2. Technical Characteristics of the Project Components[6, 7]

Features	Explanations
Irrigation area	597 ha (gros) 537 ha (net)
Irrigation system	Pressurized pipes (Sprinkler, dripping and release)
Irrigation water need	~3905.14 m^3/ha/year
Material of the pipelines	High-Density Polyethylene (HDPE)
Maintenance and repair roads / side roads	A total of 4-m-wide stabilized road for the maintenance and repair works along with the pipelines
Total Lengths of the pipelines	
Main (transmission) irrigation pipeline	6,220 m
Backup and tertiary pipelines	15,905 m
Discharge pipelines	1,200 m

Table 2-3. Details Regarding the Pipeline Lengths

Pipelines	Total length	Existing	Planned
Main pipeline	6,220	2328.03	3891.97
Backup-tertiary pipelines	15,905	8,230	7,675
Discharge pipelines	1,200	-	1,200

2.4 Associated Facilities and Labor Demands

Within the scope of the Project, it is envisaged that a total of 20 personnel will work during the construction phase. After the construction phase is completed, the operation of the irrigation facility is transferred to the irrigation unions, and the irrigation union is required to employ regular personnel. Although it has not yet been determined which irrigation union will take over the operation of the project, it is estimated that 5 people will be employed during the operation phase by the union. The maintenance and repair of the irrigation facility will be the responsibility of the irrigation union to which the Project is transferred.

The estimated duration is 18 months to complete the construction activities of the Project, and there will be a Defect Liability Period (DLP) of 18 months afterwards.

The maintenance and repair activities are estimated to last less than the construction activities since the works to be held will be less comprehensive (e.g. excavation only at the

[6] Ministry of Forest and Water Affairs (abolished), DSI 12th Regional Directorate, Kayseri, Yozgat-Aydıncık Kösrelik Pond and Irrigation Project Planning Report by Arkhes Mühendislik Müşavirlik İnş. San. ve Tic. Ltd. Şti. (Arkhes), November 2013
[7] General Directorate of DSI, Environmental and Social Screening Form of the Project, April 2023

problematic location rather than the excavation of whole pipeline network) relative to the construction phase.

The main associated facilities of the project include the Kösrelik Pond, a construction site where there will be accommodation for workers, and a storage area to be determined for the storage of materials arriving at the project site.

Kösrelik Pond itself is considered as one of the associated facilities in accordance with the WB ESF criteria. It will not be funded as part of the Project, but it is directly and significantly related to the Project, planned to be carried out contemporaneously with the Project and necessary for the Project to be viable. The characteristics of the Kösrelik Pond[8] is given in Table 2-4.

Table 2-4. Characteristics of Kösrelik Pond

Aydıncık Kösrelik Pond General Information	
Name of the Dam:	Aydıncık Kösrelik Pond
Location of the Dam:	Yozgat Province Aydıncık District
Stream Name:	Özdere
Construction Start Date:	2016
Commissioning Date:	Under Construction
Name of the Owner / Institution:	DSI / General Directorate of State Hydraulic Works
Regional Directorate to which the dam is connected:	DSI Kayseri 12th Regional Directorate
Aydıncık Kösrelik Pond Body General Characteristics	
Dam Type:	Geosynthetic Coated Rock Filling
Height of Dam from Foundation (m):	34.00
Height of the Dam from the River Base (m):	28.00
Talveg Elevation of the Dam (m):	888.00
Crest Length of Dam (m):	401.15
Crest Width of the Dam (m):	8.00
Crest Elevation of the Dam (m):	916.00
Foundation Elevation of the Dam (m):	882.00
Dam Body Volume (m^3):	539940
Reservoir Area	
Reservoir Volume at Normal Water Level (m^3):	1599000
Reservoir Volume at Minimum Water Level (m^3):	434000
Active Lake Volume (m^3):	1165000
Dead Volume (m^3):	433750
Maximum Flood Elevation (m):	914.68
Normal Water Level (m):	913.20
Minimum Water Level (m):	903.16
Basin Area (km^2):	34.7
Average Annual Rainfall (mm):	443.90

[8] General Directorate of DSİ, Department of Dams and HEPP, Aydıncık Kösrelik Pond Detailed Dam Safety Final Report (Second Phase), October 6, 2023

There are quarries where the filling/building materials for the construction of Kösrelik Pond. The Environmental Impact Assessment (EIA) processes for those quarries have been completed for those quarries and “EIA Not Required” decision has already been obtained for the quarries.

On the other hand, it is not expected to establish a quarry within the scope of the irrigation Project which is the subject of this ESMP. According to the Screening Report[7] of the Project and the information obtained from the DSI 12th Regional Directorate representatives, EIA processes have also been completed for the F-1 Permeable Material Quarry and K-1 Rock Material Quarry in Kösrelik Village Akyol Locality for the construction of Kösrelik Pond and "EIA Not Required Certificate" obtained on 19.12.2014 with the decision no of E-2014179 (see Appendix-1)

In addition to above, a limestone quarry in Çubukkuz Locality, Kösrelik Village has been established and is being used for the construction activities of the Kösrelik Pond. The mentioned quarry has an “Environmental Impact Assessment is not Required Certificate” (Decision Date: 28.04.2021 and Decision No: E-202119) and it is also given in Appendix-1.

If needed during the construction activities of the irrigation network Project, the Contractor may use those quarries.

If other quarries will be used, the Contractor will ensure that the environmental permits of the quarries and crushing-screening facility in question have been completed, the Environmental Impact Assessment (EIA) Not Required or EIA Positive decision has been received and that they operate in accordance with environmental and social criteria. The official documentation (The quarry’s or crushing-screening facility’s environmental permits, EIA Not Required or EIA Positive Certifications, etc.) will be shared with the DSI. Under no circumstances materials will be procured from facilities operating in violation of the EIA or Environmental Permit and License Regulations.

Moreover, the photographs from the site have been given in Appendix-2.

A temporary construction site will be determined to meet the social needs of workers (breaks, food, toilet, office, etc.) and to store some materials such as diesel fuel, hazardous/non-hazardous waste, etc. The Contractor may use the construction site of the Kösrelik Pond Project. Camp site installation is planned to be conducted for the construction period. The details regarding the accommodation features and mitigation measures are given in the following sections of the ESMP.

2.5 Project Timeline

The construction of the Project is estimated to be started April 2025 and completed in September 2026, including the bidding processes after the finalization and approval of the environmental and social documents to be prepared by the Consultant. There will be Defect Liability Period (DLP) after the construction is completed, which is generally the same with the period of construction. The DLP of this Project is foreseen as 18 months after the finalization of the construction.

The estimated timeline of the project activities including bidding phase and DLP is given in Table 2-5.

Table 2-5. Estimated Timeline of the Project

	2025												2026												2027												2028		
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
	-	-	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Bidding and bid evaluation for the Contractor																																							
Contract signing and construction																																							
Transfer to the Irrigation Union																																							
Defect Liability Period (DPL)																																							

3 LEGAL AND POLICY FRAMEWORK

In this chapter of the ESMP, national and international standards and requirements which will be applied to the Project have been presented.

3.1 National Legal Framework

The main legislation addressing environmental concerns in Türkiye is the Environmental Law (No: 2872). This law is designed to safeguard and enhance the environment, considered a shared asset of all citizens. Its objectives include efficient utilization and conservation of land and natural resources in both rural and urban areas, prevention of water, land, and air pollution, and preservation of the country's flora, fauna, and cultural heritage. The law establishes arrangements and precautions to improve and ensure the health, civilization, and living conditions of present and future generations, aligning with economic and social development goals and guided by specific legal and technical principles.

Other laws that encompass regulations related to environmental protection, conservation of natural resources, safeguarding cultural and natural assets, pollution prevention and control, and addressing health, safety, labor, stakeholder, land acquisition and grievance concerns include:

- Conservation of Cultural and Natural Assets Law (No: 2863; dated: 1983)
- Forestry Law (No: 6831; dated: 1956)
- Groundwater Law (No: 167; dated: 1960)
- Labor Law (No: 4857; dated: 2003)
- Law on Soil Protection and Land Use (No: 5403; dated: 2005)
- Law amending the Law No. 5403 on Soil Preservation and Land Utilization (No: 6537; dated: 2014)
- Municipality Law (No: 5393; dated: 2005)
- Metropolitan Municipality Law (No: 5216; dated: 2004)
- National Parks Law (No: 2873; dated: 1983)
- Occupational Health and Safety Law (No: 6331; dated: 2012)
- Pastures Law (No: 4342; dated: 1998)
- Public Health Law (No: 1593; dated: 1930)
- Social Insurances and General Health Insurance Law (No: 5510; dated: 2006)
- Protection of Personal Data Law (No:6698; dated 2016)
- Use of Right to Petition Law (No:3071; dated: 1984)

Aligned with the Environmental Law and additional supporting legislation, numerous regulations, communiqués, and ordinances have been issued since 1983. Many of these have undergone recent revisions to ensure alignment with European Union (EU) Directives as part of Türkiye's pre-accession efforts.

The regulations given in Appendix-3 establish management principles, rules, standards, preventive and protective measures, along with the necessary permits to attain the objectives outlined in the Environmental Law and other complementary laws pertinent to the Project. The implementation encompasses the enforcement of the policy, standards, and measures.

An indicative list of potential licenses and permits required for the Projects is outlined below:

- EIA exemption letter for Kösrelik pond and the irrigation project,
- Construction permit/license,
- Exemption letter for environmental permit,
- Operation license,

- License to process/dispose of wastes, and
- Certificate of operation.

Kösrelik Pond and Irrigation Project construction work planning was completed in 2013 and Kösrelik Pond construction tender was held in 2016 and the Workplace Delivery and Commencement of Work Record was signed on 18.05.2016. Within the scope of Kösrelik Pond Irrigation, the work started on 11.11.2014 and then it was terminated at a later date. Since time has passed and the EIA Regulation has been updated during this period of time, DSI 12th Regional Directorate asked for an opinion with an official letter to Yozgat Provincial Directorate of Environment, Urbanization and Climate Change on 04.03.2025. The opinion in question is about whether the Kösrelik Pond Project and Kösrelik Pond Irrigation Project can be evaluated within the scope of the EIA Regulation dated 29.07.2022 and numbered 31907 and whether these projects are exempt from the scope of the EIA Regulation.

In the letter dated 17.03.2025 sent by MoEUCC, it was determined that "Dams and ponds with a lake volume of 5 million m^3 and above" are included in Article 46 of the List of Projects to which Selection Criteria will be applied (Annex-2) of the *repealed* EIA Regulation dated 25.11.2014 and numbered 29186, which was in force at the time of the Project, and that the reservoir volume of Kösrelik Pond and irrigation at maximum water level is 1,810,000 m^3, it has been determined that the Kösrelik Pond and Kösrelik Pond Irrigation Project should be evaluated as exempt under the EIA Regulation. As a result, Kösrelik Pond Irrigation Project (the Project) and Kösrelik Pond Project (associated facility of the Project) are exempt from the EIA Regulation and the relevant official correspondence is provided in Appendix-1.

As explained in Section 2.4, a new quarry is not planned for this Project. Material quarries (F-1 Permeable Material Quarry, K-1 Rock Material Quarry and Limestone Material Quarry) used for the Kösrelik Pond construction have EIA Not Required Decisions. The Contractor can use this quarry if needed for the irrigation network Project. For any other quarries to be used, the Contractor must ensure all environmental permits and EIA-related certificates/decisions are obtained and that operations comply with environmental and social standards. Relevant documentation (EIA Not Required or EIA Positive Certificates, environmental permits, etc.) will be provided to the DSI.

Moreover, it is not anticipated that more than a thousand kilograms or more of hazardous waste per month will be generated within the scope of the Project and the Project is expected to be exempt from temporary storage permit for hazardous waste.

3.2 International Agreements, Policies and Standards

3.2.1 International Agreements and Conventions

The Turkish national approach to safeguarding the environment, preserving cultural heritage, and conserving biological resources is developed in accordance with pertinent international agreements that Türkiye has signed or ratified. The following are the environmental, occupational health and safety (OHS), and international labor agreements and conventions that Türkiye has endorsed:

- 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)
- Stockholm Convention on Persistent Organic Pollutants (ratified on 30.07.2009)
- UN Framework Convention on Climate Change (Kyoto Protocol) (ratified on 28.05.2009)
- UN (Rio) Convention on Biological Diversity (ratified on 11.06.1992)
- Vienna Convention or 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 (03.02.2004)
- Labor Inspection Convention (ratified in 1947)
- Promotional Framework for Occupational Safety and Health Convention (ratified on 15.06.2006)
- Worst Forms of Child Labor Convention (ratified on 25.01.2001)

3.2.2 World Bank Environmental and Social Standards and Guidelines

The WB is committed to support 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, WB has formulated an Environmental and Social Framework (ESF) comprising specific 10 (ten) 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) WB ESSs applicable to the Project are briefly described in Table 3-1 below. Out of 10 ESSs, ESS7 and ESS9 are not applicable to the Project, since ESS7 is related to the indigenous peoples which do not exist in Türkiye, and ESS9 is related to financial intermediaries.

Table 3-1. WB ESSs Applicable to the Project[9]

ESS	Topic	Brief Requirement
ESS1	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 environmental and social risks and impacts of the project throughout the project life cycle. The assessment will be proportionate 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 ESS2 to ESS10.
ESS2	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.
ESS3	Resource Efficiency and Pollution Prevention and	The Borrower will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention measures in accordance with the mitigation hierarchy.

[9] ***Source***: World Bank Group (WBG), Environmental and Social Framework (ESF), Environmental and Social Standards (ESSs)

ESS	Topic	Brief Requirement
	Management	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 EHS Guidelines. For projects that involve or support the purchase and use of pesticides and lead to increased/changed use of pesticides, Borrower will prepare a Pest (and Pesticide) Management Plan.
ESS4	Community Health and Safety	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. This standard emphasizes health, safety and security risks and their impact on communities due to project activities. The Borrower will identify risks and impacts and propose mitigation measures in accordance with the mitigation hierarchy. 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.
ESS5	Land Acquisition 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.
ESS6	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.
ESS8	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.
ESS10	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

ESS	Topic	Brief Requirement
		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 addition to the ESSs, the World Bank Group (WBG)'s Environment, Health and Safety (EHS) Guidelines should be applied to the Project. 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 to the Project. The WBG EHS Guidelines that might be applicable to the Project include but are not limited to the following:

- WBG EHS General Guidelines (2007)
- Environmental and Social Management System (ESMS) Implementation Manual: Construction (2014)
- ESMS Implementation Manual: General (2015)
- WBG EHS Guidelines for Construction Materials Extraction (2007)
- Introduction to Health Impact Assessment (2009)
- Contractor's Environmental and Social Performance Management Good Practice Rating (2017)

In accordance with the WB ESF, a framework known as the Environmental and Social Management Framework (ESMF) has been crafted for TULIP. As specific locations and technical details of sub-projects emerge during implementation, the ESMF serves the purpose of evaluating the overall risks and impacts associated with the project. It outlines a comprehensive strategy for managing environmental and social aspects, addressing potential impacts linked to TULIP.

The ESMF adheres to both the requirements of the WB ESF and the national legal framework for environmental and social management. It stands as a crucial document that the MAF pledges to adhere to, ensuring compliance with national legislation and the WB ESF. Before the initiation of project implementation, the ESMF is disseminated to stakeholders for consultation. It acts as a guiding document for a comprehensive approach to environmental and social management, with the aim of identifying and mitigating potential impacts.

Containing various measures and plans, the ESMF aims to diminish, alleviate, and manage adverse risks and impacts. These measures and plans are intended for implementation during the preparation and execution of sub-projects to effectively address environmental and social concerns at the sub-project level.

Furthermore, the ESMF establishes protocols for environmental and social screening, review, approval, and implementation of project activities. It defines essential institutional arrangements, allocates responsibilities, and underscores the significance of capacity building for the successful implementation of ESMF provisions. The framework also includes mechanisms for public consultation and the disclosure of project documents. It provides a summary of stakeholder engagement practices and highlights the presence of a separate Stakeholder Engagement Plan (SEP) that furnishes detailed information on engagement and the Grievance Mechanism (GM).

3.3 Major Differences Between Turkish Legislation and World Bank ESSs

There are a number of differences or gaps between Turkish environmental, social and OHS legislation and WB ESF and ESSs in impact assessment processes. Those differences or gaps and studies to fill the gaps have been summarized in Table 3-2 and Table 3-3.

Table 3-2. Differences Between Turkish Legislation and WB Impact Assessment Processes[10]

Topic	WB ESF	Turkish Legislation
Project Categorization	Projects are classified into one of four classifications as High Risk, Substantial Risk, Moderate Risk or Low Risk taking into account 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 or 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. The Project is exempt from 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 associated with project activities and associated facilities are assessed.	The 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 taken into account 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.
Stakeholder Engagement	An integral part of E&S assessment is conducted in accordance with ESS10. 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 (Annex-I), and only requires announcement of the environmental assessment together with the justification.

Table 3-3. Major Gaps Between ESSs and Turkish Legislation[11]

ESSs	Gaps	Study to Fill the Gaps
ESS1	▪ Social impact assessment is not	Project specific environmental and social

[10] The table has been formed by comparison of the Turkish Legislation and WBG ESF and ESSs.
[11] The table has been formed with the help of previous table and TULIP ESMF.

ESSs	Gaps	Study to Fill the Gaps
	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, ▪ 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), ▪ Limited or no requirement to cover cumulative impacts with other projects in the Turkish EIA, ▪ Limited emphasis on the associated facilities, ▪ 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.	assessment studies (ESMP, SEP, RP, etc.) will be prepared in line with ESS1. In this respect, potential environmental and social impacts of the Project will be part of the assessment. The environmental and social assessment will include impacts of the associated facilities and potential cumulative impacts. Depending on the level of the impacts and proposed mitigation measures together with residual impact analysis, sub-management plans will be annexed to the ESMP.
ESS2	▪ In general, Turkish national laws and regulations regarding labor and working conditions satisfies ESS2 requirements. ▪ Worker grievance mechanism is the main gap between national legislation and ESS2. Per the Turkish national legislation on labor and working conditions, there is no specific requirement related to grievance mechanism that allow workers to communicate their complaints to the employers.	Labor Management Procedure (LMP) is a component of the ESF instruments. LMP provides guidance on the required mitigation or management implementations such as workers' GM, code of conduct etc. stipulated by ESS2 and relevant WB EHS Guidelines. In line with the LMP developed for the Project, Project specific LMP will be developed by the Contractor, as relevant.
ESS3	▪ Most of the relevant national legislation regarding laws and regulations is in line with EU directives. There is no major gap between ESS3 and national legislative requirements. However, national EIA does not provide detailed management perspective on potential impacts, mitigation measures and residual impacts and monitoring. To restate, sub-management plans are not specifically defined in the national EIA process. ▪ The specific studies regarding resource use and pollution prevention such as Water Source Vulnerability Analysis, Greenhouse Gas (GHG) estimations etc. are not included in national EIA process.	Sub-management plans will be developed as part of ESMP, for construction and operation phases of the project, if deemed necessary. These plans also provide requirement stipulated in relevant WB EHS Guidelines.
ESS4	▪ In general, there is no major gap in terms of policy level. Even so, project level management of specific risks such as labor influx, sexual exploitation and	Management plans (such as Traffic Management Plan, Community Health and Safety Management Plan, Emergency Preparedness and Response Plan, etc.) will

ESSs	Gaps	Study to Fill the Gaps
	abuse and sexual harassment (SEA/SH) are the key gaps in terms of ESS4.	be prepared for the Project, as relevant and necessary, as a part of ESMP. The ESMP (and LMP) will include relevant provisions for SEA/SH risks and impacts.
ESS5	▪ Turkish legislation on land acquisition mainly corresponds to requirements stipulated by ESS5. Yet, 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 ESS5 requirements.	The Resettlement Framework in line with the ESMF has been prepared to provide a guidance to assess any risk of resettlement and to prepare Project specific RP in case a requirement. Project specific RP will be prepared in order to account for discrepancies with the national legislation. Particular concern will be given in the RP on vulnerable groups. Livelihood impacts of the Project on informal users will be assessed and Livelihood Restoration Plan (LRP) will be prepared as relevant to the Project.
ESS6	▪ There is no gap in terms of policy level. Nevertheless, in some cases, the level of considerations of not legally protected sensitive ecological areas such as Key Biodiversity Areas in national EIA Process do not sustain the requirements in ESS6. On top of that, management and monitoring of potential impacts, mitigation measures and residual impacts are not detailed in general.	Within the scope of TULIP, sub-projects which have significant impacts on biodiversity are considered ineligible. This Project does not have significant impacts on biodiversity since the Project area includes modified habitat consisting of agricultural lands and a Biodiversity Management and Action Plan is not required.
ESS8	▪ Turkish national legislation on protection of cultural assets mainly satisfied the ESS8 for physical cultural heritage but fails to cover intangible cultural heritage.	A chance find procedure provided in Appendix-5 will be followed during the construction phase of the Project. 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.
ESS10	▪ Effective and transparent stakeholder engagement is the main gap in terms of ESS10. Within this scope, a Stakeholder Engagement Plan is 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 life cycle.	Stakeholder Engagement Framework (SEF) is in place as part of ESF documents. Project level SEP 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 the Project and the grievance mechanism.

3.4 Project Categorization

Categorizing projects is a critical element within the WB ESF. Projects, including those involving Financial Intermediaries (FIs), are categorized into four groups: *High Risk*, *Substantial Risk*, *Moderate Risk*, or *Low Risk*. This classification considers factors like project type, location, sensitivity, and scale, as well as potential environmental and social risks and impacts.

As a result of the screening process, the environmental risks associated with the Project are considered to be "**Moderate**" since:

- For the pipes to be passed underground, a limited area will be excavated during the construction activities, and the excavated material will be used to restore the project area to its former state.
- There are no legally protected natural areas and internationally recognized areas in or close vicinity of the Project site.
- The project includes modified habitat consisting of agricultural lands and thus considered as a modified habitat.
- Possible environmental impacts of the construction activities on the local community will be low to medium, predominantly reversible, mostly limited to the Project pipeline route and its area of influence. Moreover, the duration at one location for construction will be short-term and the construction activities along the pipeline route will be consecutive.

The social risks associated with the Project are considered to be "**Moderate**" since:

- The Project area is utilized as agricultural fields, and grazing lands.
- Land acquisition will be required since most of the properties are both private and common.
- There will be no need for physical resettlement during the Project. Economic resettlement will be evaluated after the final Resettlement Plan including livelihood restoration.
- The villagers who use the agricultural lands and grazing areas may continue to utilize the lands since the pipeline will pass through underground and the surface ground will be restored in its former state.

4 ASSESSMENT METHODOLOGY

The primary objective of conducting an environmental and social impact assessment is to identify and evaluate potential risks and adverse effects that may arise from the activities of the Project on both the natural environment and the socio-economic well-being of the local and regional population, including the community and workforce. This assessment takes into consideration the characteristics and activities of the Project as well as the existing conditions in the Project area.

Following the assessment, relevant mitigation measures are devised to prevent, minimize, alleviate, or offset significant adverse impacts while also enhancing beneficial effects. Additionally, the assessment evaluates the significance of any residual adverse effects on the environment and community that may persist even after implementing the mitigation measures. Lastly, the assessment outlines planned monitoring activities aimed at assessing the effectiveness of the proposed mitigation measures.

Throughout the construction and operation phases of the Project, there is a potential for environmental and social impacts or risks stemming from the Project activities. During the construction phase, these impacts are typically short-term with low to medium magnitude but can be locally significant. They may involve issues such as traffic, noise, vibration, air quality, soil disturbance and contamination, waste management, community health and safety, as well as labor and working conditions, including occupational health and safety.

While adverse environmental impacts during the operation phase are not expected to be significant due to the project's public interest nature, noise and soil contamination related impacts on sensitive receptors, as well as occupational health and safety risks, may arise, particularly during maintenance and repair activities. Maintenance and repair work on channels may result in minor environmental impacts like soil contamination and increased noise levels, which are local and short-term in nature with low significance. In line with the results of the interview within the scope of the resettlement field survey, to avoid the economic and social impacts in areas planned for expropriation, responses have indicated preferences for acquiring new land, limiting the relevant activity, and prioritizing other economic activities. In this context, the expected social impact will be addressed through livelihood restoration measures and the payment of full replacement costs during the resettlement process.

To appropriately address these potential impacts, both positive and negative effects must be identified and assessed, leading to the definition of relevant mitigation measures. The evaluation of environmental and social impacts and risks is conducted based on specific criteria given below:

- the nature/type of impact (positive or negative, direct, indirect, cumulative),
- extent/area of impact (on-site/project footprint, local, regional, national),
- duration of impact (short-term, mid-term, long-term, permanent), and
- likelihood of impact occurrence (very likely/certain, likely, unlikely).

The severity of adverse impacts is assessed using these criteria, along with the sensitivity of receptors or sources exposed to the impact, whenever possible. The significance of impacts is evaluated both without mitigation measures and with proposed mitigation measures in place. This evaluation helps determine the significance of residual impacts, which refers to impacts that remain after implementing mitigation measures.

The following impact significance matrix (see Table 4-1) depending on the estimated magnitude of the impact and reversibility of the change due to the impact has been used to

determine the significance of the environmental, social, health and safety (ESHS) impacts of the Project activities during the construction and operation phases.

Table 4-1. Impact Significance Matrix[12]

Significance of Impact				
Reversibility of the Change	**Magnitude of Impact**			
	High	**Medium**	**Low**	**Negligible/None**
Irreversible	Very High	High	Moderate	Negligible/None
Partially Reversible	High	Moderate	Low	Negligible/None
Highly Reversible	Moderate	Low	Low	Negligible/None
Fully Reversible	Negligible/None	Negligible/None	Negligible/None	Negligible/None

The terms regarding the significance of an impact can be described as follows:

- ***Very High:*** An impact that causes irreversible and large-scale change, affecting a highly sensitive receptor or source, with a very likely or certain occurrence. For example, permanent loss of biodiversity or cultural heritage, or severe violation of human rights or labor standards.
- ***High:*** An impact that causes partially reversible and large or medium-scale change, affecting a moderately sensitive receptor or source, with a likely or probable occurrence. For example, significant degradation of air or water quality.
- ***Moderate:*** An impact that causes highly reversible and medium-scale change, affecting a lowly sensitive receptor or source, with an unlikely or possible occurrence. For example, moderate increase of noise or traffic levels.
- ***Low:*** An impact that causes fully reversible and negligible change, affecting a non-sensitive receptor or source, with a very unlikely or improbable occurrence. For example, slight increase of dust or odor emissions, or minor improvement of social infrastructure or services.
- ***Negligible/None:*** An impact that causes no discernible change or has a positive effect that outweighs any negative effect. For example, no impact or net benefit on the environment or the community.

[12] ***Reversibility:*** The degree to which the change caused by the impact can be restored to its original state or condition.
Magnitude: The scale or intensity of the impact, measured by its extent, duration, and likelihood.
Impact Significance Level: The overall rating of the impact, based on its reversibility and magnitude, as well as the sensitivity of the receptors or sources affected by the impact.

5 ENVIRONMENTAL BASELINE OF THE PROJECT

In this chapter, the environmental baseline, i.e. the existing environmental conditions, of the Project area that can be affected by the Project activities has been explained.

5.1 Geographical Location

The Project area lies between Aydıncık district in Yozgat province and Alaca District of Çorum province, and it is within the borders of the 14th Yeşilırmak Basin.

The irrigation area which will be resulted in after the Project realization will cover the agricultural lands in Kösrelik village, Kocabekir village and Mercimekören village in Aydıncık district of Yozgat province and Körpınar village in Alaca District of Çorum province.

The Project area is located in the northeast of Kösrelik Village and covers the agricultural lands as irrigation area among the Körpınar, Kocabekir and Mercimekören villages. The Project area is approximately 85-90 km from Yozgat province, 4,5-9 km from Aydıncık district, 75-80 km from Çorum province and 40-45 km from Alaca district.

The location of the Project area is shown in Figure 2-1.

5.2 Land Use, Soil Quality and Topography

There is a total of 260,153 ha of meadow and pastureland within the borders of Yozgat Province. Meadow and pastureland cover 18% of the total agricultural land. Existing meadow and pasture areas are located within the villages based on agriculture, and there are large meadows and pastures based on animal husbandry.

According to the information provided in the 2022 Yozgat Provincial Environmental Status Report, land use situations are summarized in Table 5-1, Figure 5-1 and Figure 5-2 below.

Table 5-1. Yozgat and Çorum Land Classification (CORINE)[13, 14]

Classification of the Land	Size of the Area	
	hectare (ha)	%
Yozgat Province		
Artificial areas	22,171.53	1.62
Agricultural areas	888,419.70	64.92
Forest and semi natural areas	450,954.40	32.95
Wetlands	166.64	0.01
Water structures	6,750.50	0.50
TOTAL	**1,368,462.77**	**100**
Çorum Province		
Artificial areas	13,549.98	1.09

[13] 2022 Yozgat Provincial Environmental Status Report, Yozgat Provincial Directorate of Environment, Urbanization and Climate Change, 2023, Retrieved from https://webdosya.csb.gov.tr/db/ced/icerikler/yozgat-ilcdr-2022-20230920101503.pdf

[14] 2022 Çorum Provincial Environmental Status Report, Çorum Provincial Directorate of Environment, Urbanization and Climate Change, 2023, Retrieved from https://webdosya.csb.gov.tr/db/ced/icerikler/corum-ilcdr-2022-20230914130852.pdf

Classification of the Land	Size of the Area	
	hectare (ha)	%
Agricultural areas	645,352.86	51.94
Forest and semi natural areas	573,241.15	46.14
Wetlands	596.41	0.05
Water structures	9,727.99	0.78
TOTAL	**1,242,468.39**	**100**

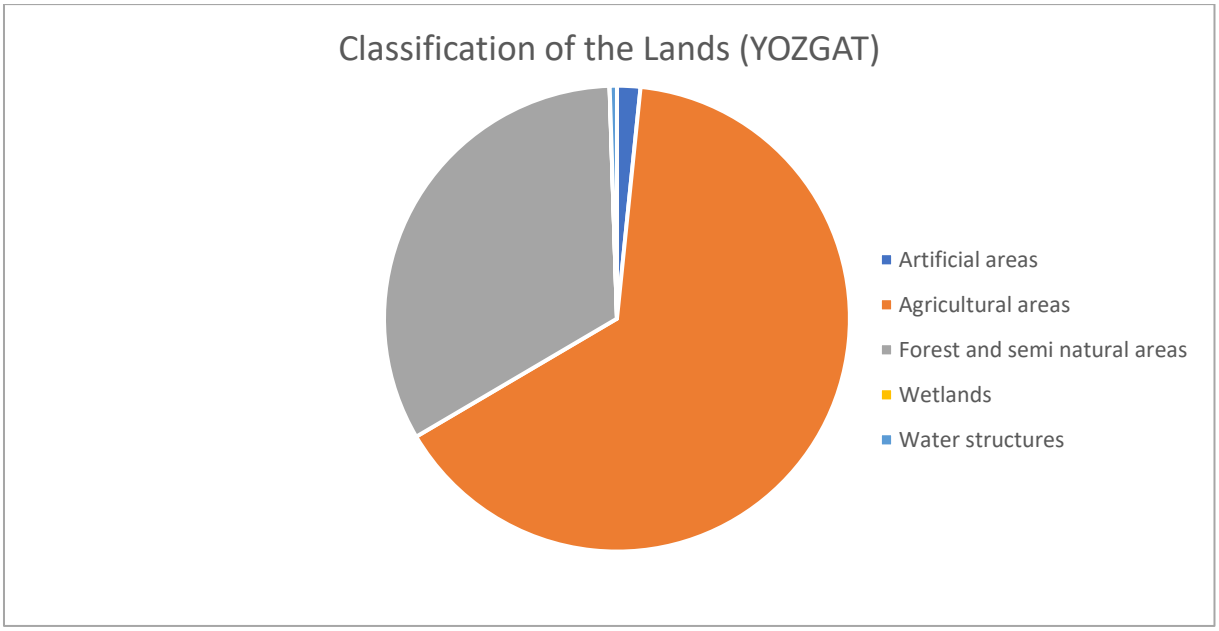

Figure 5-1. Land Classification of Yozgat Province[13]

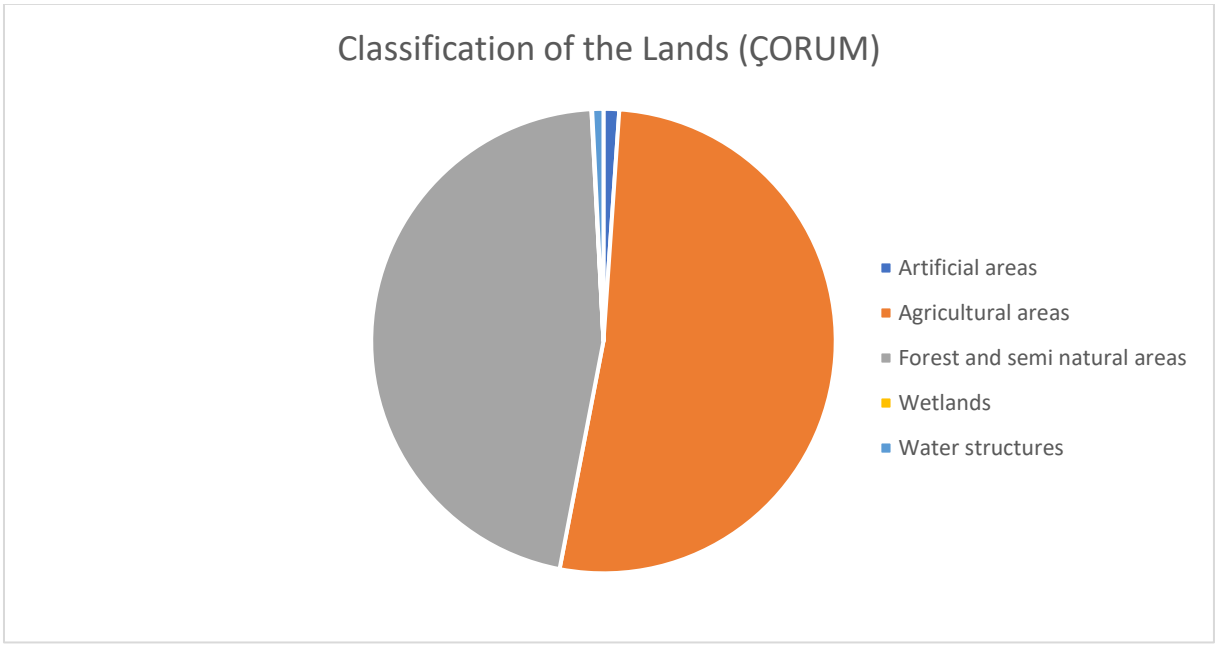

Figure 5-2. Land Classification of Çorum Province[15]

According to the gathered information by mukhtars, the results related to land use patterns are given in below for each of the villages, respectively:

1. **Kösrelik Village:** All 230 households are engaged in agriculture. Sharecropping, tenant farming, and leasing are practiced. Those who live outside the village have their land cultivated by someone from the village. The largest plots of land range between 70-100 decares. The village pastureland covers 500-600 decares, and the forest land spans 5,000-6,000 decares. Agricultural land amounts to 10,000 decares. The village also has communal land designated as a cemetery, covering 8,347 m².
2. **Mercimekören Village:** There are about 20 active households in the village. 95% of the village population lives outside the village. Renting out agricultural land is common.
3. **Kocabekir Village:** The village's permanent population consists of 30 households. There are 200 households living outside the village. Their primary source of livelihood is farming, with a 50-50 distribution between dry and irrigated agriculture. There is over 1,000 hectares of pastureland, and there is no state or treasury land.
4. **Körpınar Village:** The village's permanent population consists of 4 households. There are 8-10 households living outside the village. The village has 10 decares of communal land, with no state or treasury land. There are 1,000 decares of pastureland, but it is unclear whether the village holds forest village status.

Moreover, the project area is located at the in Kösrelik Village, as well as in the Körpınar, Kocabekir, and Mercimekören areas. The topographical map of the Project is given in Figure 5-3 and CORINE (Coordination of Information on the Environment) Land Cover Map[15] is given in Figure 5-4.

According to CORINE Land Cover map given in Figure 5-4, the Project area mostly includes “permanently irrigated land” and slightly includes “complex cultivated patterns” near Kocabekir village.

In addition, a Land Use Map of the Project area has been prepared showing the features of current land use, land use capability classification, major soil group, soil combination and erosion classification and shared with Figure 5-5. Accordingly, information on the other land and soil features are summarized with Table 5-2.

Table 5-2. Land Use Features of the Project Area

Land Use Code	Land Use Features		Explanations	
K,15,2 K II	**BTG**	Major Soil Group	**K**	Colluvial soil
	TOK	Soil Combination	**15**	Class D slope/soil depth “shallow” (20-50 cm)
	ERZ	Erosion Classification	**2**	Moderate water and wind erosion
	SAK	Current Land Use	**K**	Dry agriculture (fallow)
	AKK	Land Use Capability Classification	**II**	Tillable arable land
F,11,2 K IV	**BTG**	Major Soil Group	**F**	Reddish brown soil
	TOK	Soil Combination	**11**	Class C slope/soil depth “shallow” (20-50 cm)
	ERZ	Erosion Classification	**2**	Moderate water and wind erosion
	SAK	Current Land Use	**K**	Dry agriculture (fallow)

[15] https://corinecbs.tarimorman.gov.tr/

Land Use Code	Land Use Features		Explanations	
	AKK	Land Use Capability Classification	**IV**	Tillable arable land
K,13,2 B II	**BTG**	Major Soil Group	**K**	Colluvial soil
	TOK	Soil Combination	**13**	Class D slope/soil depth “deep” (90+ cm)
	ERZ	Erosion Classification	**2**	Moderate water and wind erosion
	SAK	Current Land Use	**B**	Garden (dry)
	AKK	Land Use Capability Classification	**II**	Tillable arable land
F,12,2 M VI	**BTG**	Major Soil Group	**F**	Reddish brown soil
	TOK	Soil Combination	**12**	Class C slope/soil depth “very shallow” (0-20 cm)
	ERZ	Erosion Classification	**2**	Moderate water and wind erosion
	SAK	Current Land Use	**M**	Pastureland
	AKK	Land Use Capability Classification	**VI**	Land unsuitable for tillage agriculture
K,4,1 S I	**BTG**	Major Soil Group	**K**	Colluvial soil
	TOK	Soil Combination	**4**	Class B slope/soil depth “deep” (90+ cm)
	ERZ	Erosion Classification	**1**	Slight water and wind erosion
	SAK	Current Land Use	**S**	Irrigated agriculture
	AKK	Land Use Capability Classification	**I**	Tillable arable land
K,4,1 Bs I	**BTG**	Major Soil Group	**K**	Colluvial soil
	TOK	Soil Combination	**4**	Class B slope/soil depth “deep” (90+ cm)
	ERZ	Erosion Classification	**1**	Slight water and wind erosion
	SAK	Current Land Use	**Bs**	Garden (irrigated)
	AKK	Land Use Capability Classification	**I**	Tillable arable land
A,2,1 Sy I	**BTG**	Major Soil Group	**A**	Alluvial soil
	TOK	Soil Combination	**2**	Well drained, medium textured
	ERZ	Erosion Classification	**1**	Slight water and wind erosion
	SAK	Current Land Use	**Sy**	Irrigated agriculture (insufficient)
	AKK	Land Use Capability Classification	**I**	Tillable arable land

Moreover, according to the data received from Yozgat Provincial Directorate of Agriculture and Çorum Provincial Directorate of Agriculture, commercial fertilizer is used in a total area of 474,303 hectares in Yozgat, 276,737 hectares in Çorum, and the plant nutrients and amounts consumed annually are given in Table 5-3.

Table 5-3. Plant Nutrients Consumed Annually as Commercial Fertilizer[13, 14]

Plant Nutrient	Amount Consumed (ton)	
	Yozgat	Çorum
Nitrogen	125,765	55,000
Phosphorus	67,193	20,000

Plant Nutrient	Amount Consumed (ton)	
	Yozgat	Çorum
Potassium	1,862	15,600
Total	**194,820**	**90,600**

However, in addition to fertilizers, pesticides such as insecticides, herbicides, fungicides and rodenticides are also used in agriculture, and the usage amounts of these chemicals in 2022 are as in the following Table 5-4.

Table 5-4. Amounts of Pesticides Used in 2022[13, 14]

Pesticides	Amount Consumed (ton)	
	Yozgat	Çorum
Insecticide	6.46	0.40
Herbicide	22.78	43.38
Fungicide	25.10	15.24
Rodenticide	0.67	0.019
Acaricides	-	0.27
Others	-	0.074

According to the above data, it is likely that the soil quality in the Project area might be affected by the excess usage of the chemicals above for agricultural purposes, however, there are no other activities such as industrial or mining activities which can affect the soil quality in the region.

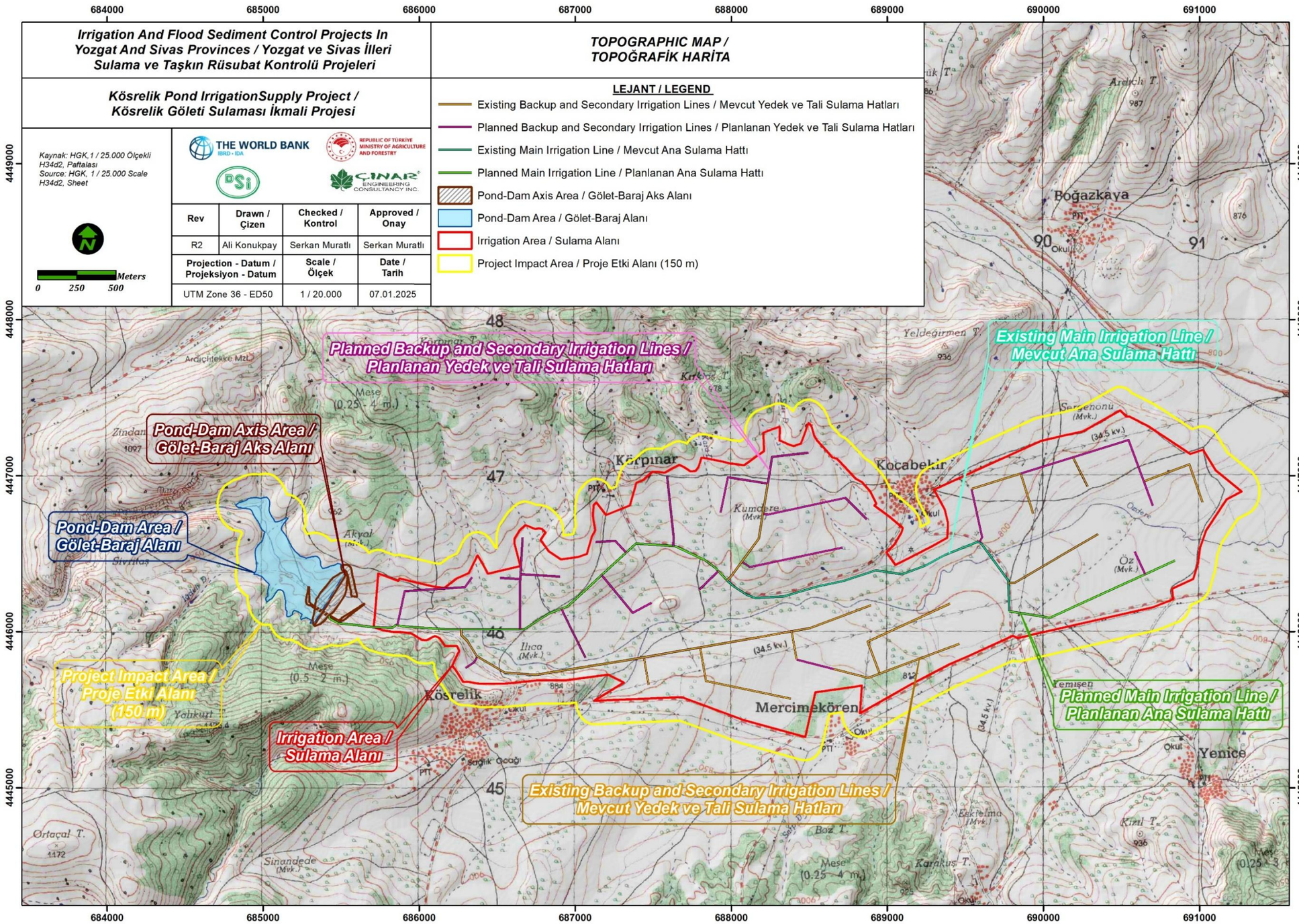

Figure 5-3. Topographical Map of the Project Area

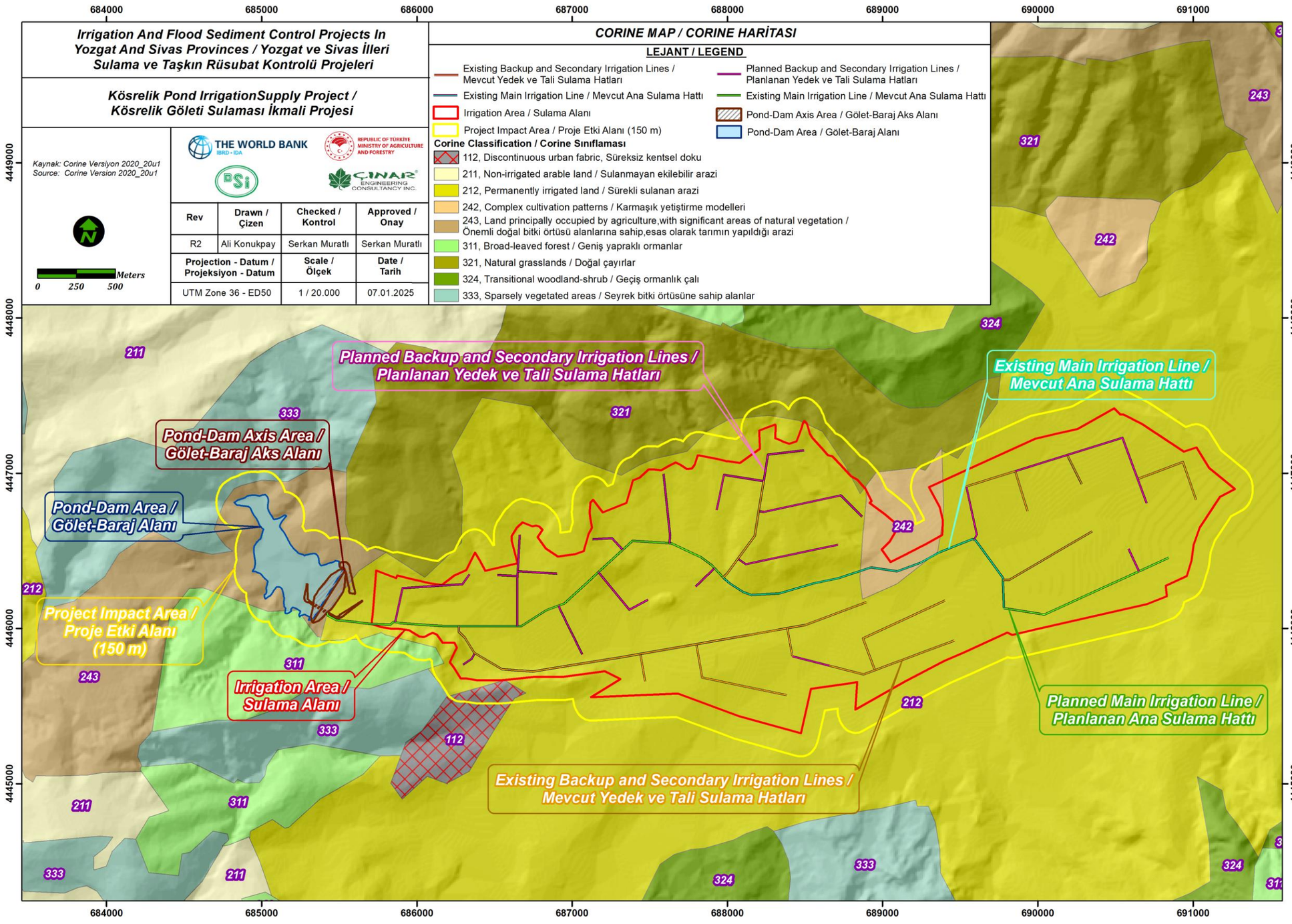

Figure 5-4. CORINE Land Cover Map of the Project Area

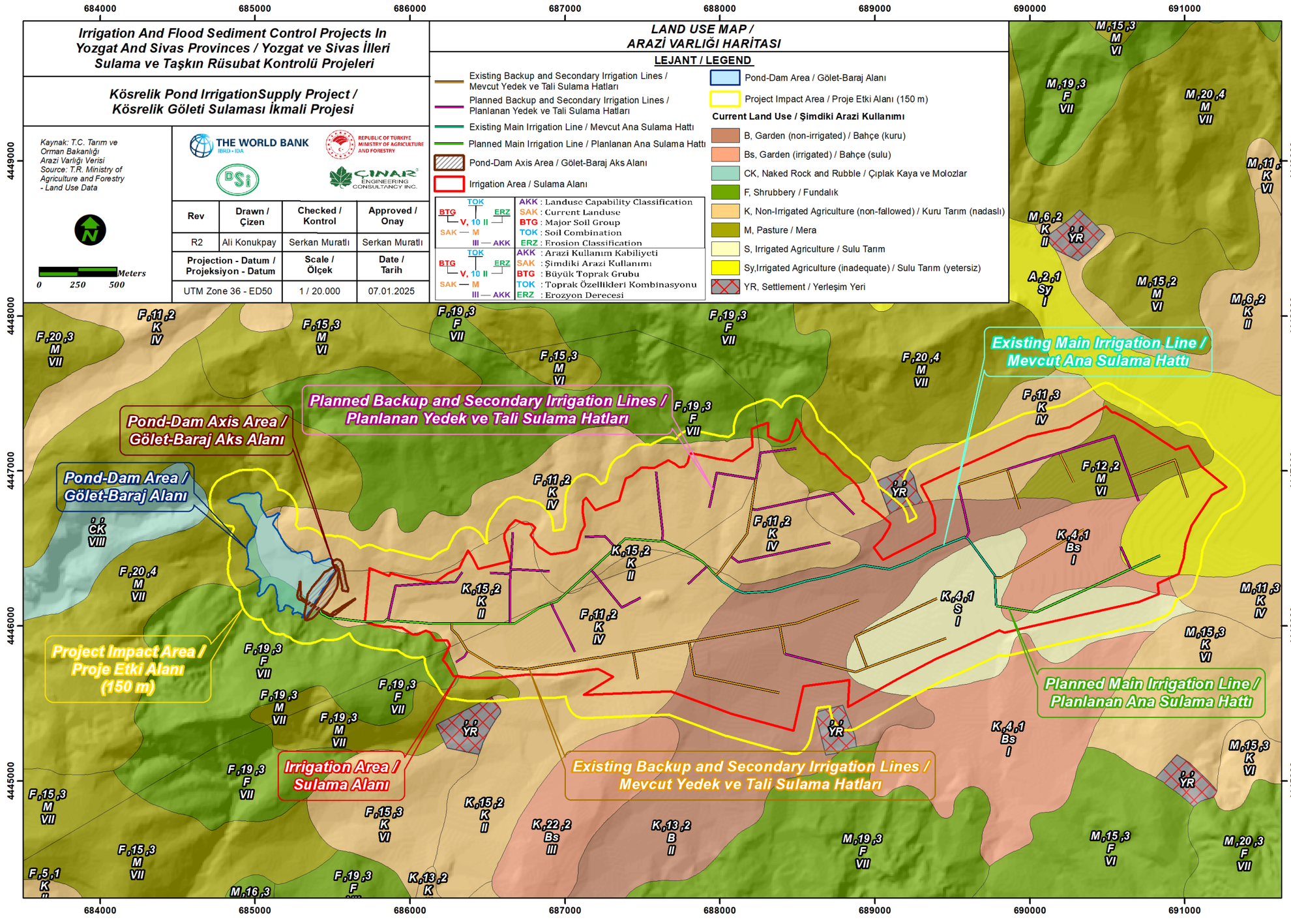

Figure 5-5. Land Use Map of the Project Area

5.3 Geology

5.3.1 Regional Geology

The region situated in a zone where Sakarya Continent and İzmir-Ankara-Erzincan Ocean (IAEO) tectonically juxtaposed. The basement of the Sakarya Continent are formed by Late Paleozoic aged Tokat metamorphics and Triassic Karakaya formation containing sligthly metamorphic clastic, carbonates, volcanites and olistholith of Carboniferous, Permian aged carbonate rocks. This basen closed at Upper Triassic time and a new transgression began at Lias time on it and the region covered by Jurassic aged clastic sediments and Late Jurassic-Cretaceous aged platform and slope sediments (Bilecik limestone, Helvacı and Sarılar formations).

To the South beginning from Cretaceous time Mesozoic aged ocean (IAEO) subducted underneath the Sakarya Continent and subduction-accretion prism developed. On this prism firstly late Santonİan-Maastrichtian aged Çalarasın formation represented by arc-magmatics, back-arc and forearc sediments and then Early Eocene-Lutetian aged turbiditic Yoncalı formation deposited unconfirmable on the older units.

After closing of IAEO and collision between Sakarya-Kırşehir continent Lutetian aged Meryemdere formation consist of clastic, carbonate and its volcanic rocks overlies these older rocks.

After Oligocene time as a result of these compressional tectonics terrestrial condition affected the study area. İn the Çorum basin Miocene aged Morandere formation and Late Pliocene-Pleistocene aged Büyükşeyhefendi formation, Ouaternary unites formed represented by lacustrine sediments and river sediments respectively.

5.3.2 Geology of Project Area

Kösrelik Pond dam body is located entirely on the sandstone interbedded marl siltstone succession belonging to the Yoncalı formation, which consists of Eocene aged clastic rocks surfacing in large areas in the region. Most of the reservoir area of Kösrelik Pond is dominated by sandstone interbedded marl siltstone succession of the Eocene aged Yoncalı formation, and locally in the middle and upstream parts of the reservoir area, there are Triassic aged Karakaya formation with pebble, sandstone and limestone succession and limestone blocks traced within this formation.

Within the irrigation area covered by the project, Quaternary-aged alluviums (Qal), Upper Pliocene-Pleistocene-aged gravelstone and mudstone (plQb) of the Büyükşeyhefendi Formation, and Cuvierian-Lutetian-aged sandstone interbedded marl and siltstone (Tey) of the Yoncalı Formation, which also underlie the Gölet Dam Axis Area, are exposed.

The other common units in the area include andesitic-basaltic lava, tuff, and agglomerate (Temeb) of the Middle-Upper Eocene-aged Beynamaz Formation, conglomerate, sandstone, sandy limestone, limestone, and volcanics (Tk) of the Triassic-aged Karakaya Formation, as well as limestone blocks (kb) also from the Triassic period.

There are no protected geological sites or unique geological or geomorphological structures within the project area and its immediate surroundings.

The geological units and lithological features in the project area and its surroundings are given below, from oldest to youngest. The geological map of the project area and its surroundings is given in Figure 5-6.

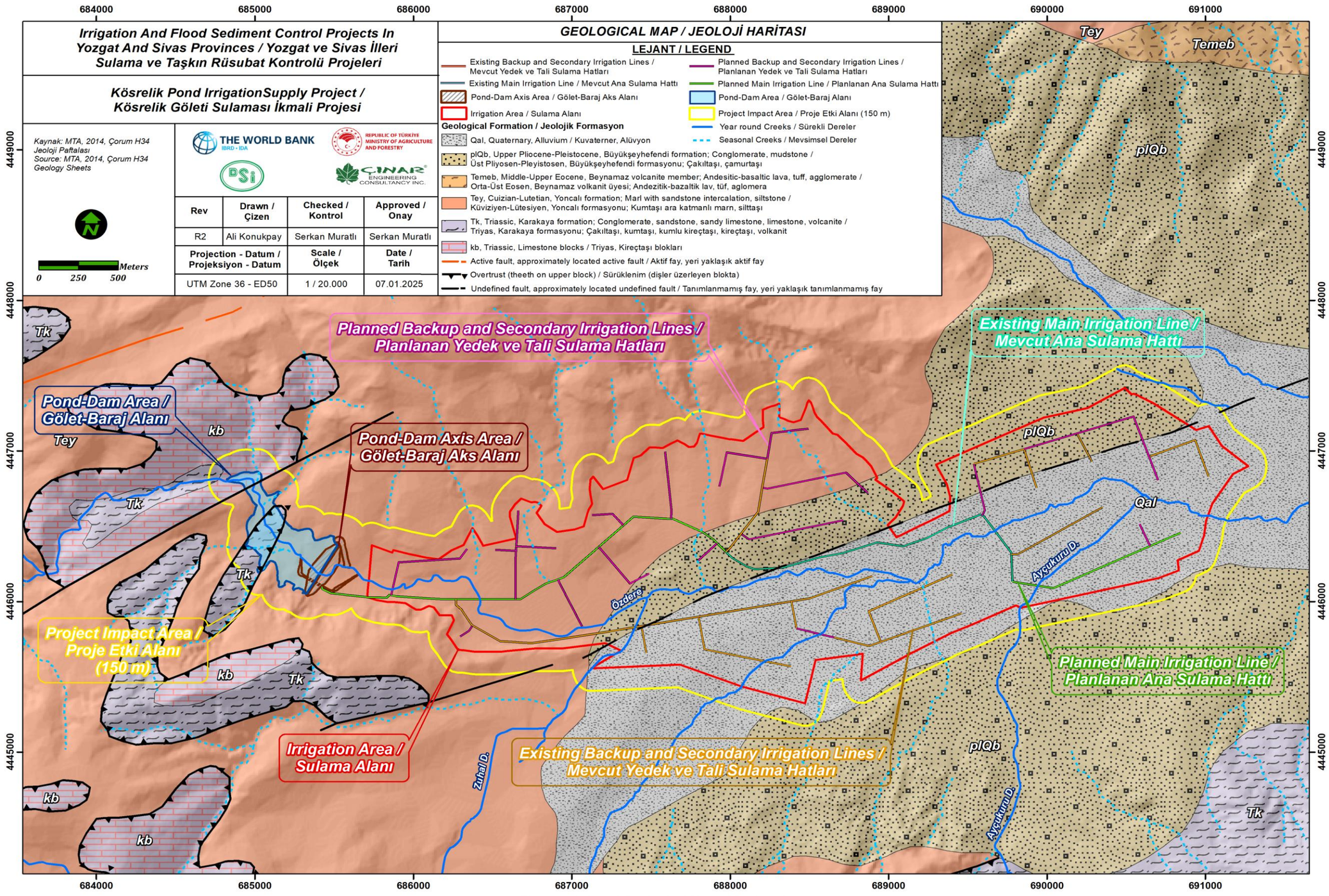

Figure 5-6. Local Geological Map of Project Area

5.3.3 Stratigraphy

Mesozoic

Triassic

Karakaya Formation (Tk)

The unit consists of Permian-aged arkosic sandstone, conglomerate, sandstone, mudstone, sandy limestone, limestone, and volcanic rocks containing clastic-carbonate blocks (Pb). The unit is yellow, gray, brown, and gray in color, thin- to medium-bedded, and tightly folded. The unit, which begins with clastics at the base, transitions upwards into Middle-Late Triassic-aged sandy limestone and limestone as the carbonate content increases. The Karakaya Formation laterally intercalates with a volcanic sequence composed of metavolcanics, metatuffs, volcanoclastics, and agglomerates.

In the study area, the Karakaya Formation lies above the Tokat metamorphics at the base, but the relationship is unclear. Various studies suggest the relationship to be tectonic, gradational, or an angular unconformity. At the top, it is unconformably overlain by Jurassic-Cretaceous-aged clastic and carbonate rocks. The unit is also tectonically situated above the Yoncalı Formation within the study area, as a result of Lutetian movements.

The Karakaya Formation was deposited in a basin where clastics and carbonates were deposited, volcanism was occasionally active, and clastics and limestone blocks from the basin margins participated in the deposition process.

Limestone Blocks (kb)

The various-sized blocks within the Karakaya Formation have been identified as limestone blocks of Silurian, Carboniferous, Permian, and Triassic ages.

The carbonate rocks within the Karakaya Formation, which are of Triassic or older age, acquired a blocky appearance due to tectonic influences during the basin's closure.

The limestone generally does not exhibit lateral continuity, presenting irregular geometric shapes. It is locally massive and unlayered, while in other areas, it is medium- to thick-bedded, fractured, and ranges in color from light gray to dark gray, yellowish, and blackish. The contacts between these limestone blocks and the surrounding matrix are almost entirely tectonic. Crushed and fragmented zones are observed both in the matrix and within the blocks.

Senozoic

Cuizian-Lutetian

Yoncalı Formation (Tey)

The unit, consisting of a succession of marl and siltstone interbedded with sandstone, is referred to as the Yoncalı Formation.

The unit, known as the Yoncalı Formation, consists of marl interbedded with sandstone and siltstone, and occasionally conglomerates. The marl and siltstones are grayish to greenish, thin- to medium-bedded, with occasional parallel lamination, shell fragment breakage, and signs of bioturbation. The sandstones are yellowish-gray, thin-bedded, fine- to medium-grained, well-cemented, graded, and show both parallel and cross lamination. Conglomerates are found in the upper levels of the formation but lack lateral continuity. The unit is fossiliferous at the base and becomes increasingly poor in fossils towards the top. The thickness of the unit ranges from 1,200 to 2,000 meters.

The unit is represented by sediments reflecting shelf and basin environments. It consists of turbiditic deposits at the base and shallow marine deposits at the top. The presence of

planktonic fossils in the lower parts and the increased concentration of benthic forms in the upper parts indicate a shallowing upward sequence.

Middle-Upper Eocene

Beynamaz Volcanite Member (Temeb)

The unit observed in the upper levels of the Meryemdere Formation, consisting mainly of basaltic-andesitic lava, tuff, agglomerate, and volcanic-sedimentary interbeds, is named after Beynamaz Mountain, located about 25 km east of Kargı district.

The Beynamaz Volcanite Member consists primarily of basaltic-andesitic lava, agglomerate, and tuff. The dominant rock type, agglomerate, includes marine layers along with tuff interbeds. It is composed of volcanic rock fragments that are brown, gray, reddish-black, irregularly arranged, rounded to angular, and vary in size. The andesites within the Beynamaz Volcanite Member are widely distributed, brownish-gray in color, and contain small plagioclase crystals, along with augite and opaque minerals, embedded in a glassy matrix. There is also a small amount of basalt lava present.

Upper Pliocene-Pleistocene

Büyükşeyhefendi Formation (plQb)

The unit, consisting of gravel and mudstone, is named the Büyükşeyhefendi Formation.

The Büyükşeyhefendi Formation consists of red, brown, and yellowish gravel, mudstone, and a small amount of sandstone. The gravel is thick-bedded, poorly sorted, matrix-supported, and loosely cemented. The sandstone is thin- to medium-bedded, loosely cemented, poorly sorted, coarse-grained, and mostly thick and parallel laminated.

The unit is discordantly related to the underlying older units and is unconformably overlain by Quaternary-aged sediments. Its thickness is approximately 300 meters, and it was deposited in an alluvial fan environment.

Quaternary

Alluvium (Qal)

The unit, represented by meandering, braided river and floodplain sediments, consists of unconsolidated gravel, sand, silt, and mud deposits. It is distributed along the valleys north of Ortaköy, Çorum Stream, Çekerek River, and around Aydıncık.

5.4 Water Resources and Hydrology

The project area is located within the borders of Aydıncık district in Yozgat province and is situated within the Yeşilırmak Basin, one of the major water basins designated across Türkiye.

The planned Kösrelik Dam's water source is the Özdere Stream, which originates from Yayla Hill at an elevation of approximately 1,300 meters and flows from west to east within the irrigation area. Within the irrigation area, there are several streams with continuous and seasonal flow. The surface waters, which flow in both south-to-north and north-to-south directions, drain into the Özdere Stream that passes through the irrigation area. All surface waters within the irrigation area converge and flow into the Çekerek Stream, which then discharges into the Yeşilırmak River.

Approximately 2.2 km south of the Kösrelik Dam Irrigation Area lies the Pelitli Lake Picnic Area. Improvement works have been carried out for agricultural irrigation in the fields located in the plain to the north and northeast of Pelitli Lake, and a network of interconnected ditch and canal systems, also observed within the Kösrelik Irrigation Area, is present.

The ongoing construction of the Kösrelik Dam by the State Hydraulic Works (DSI) on the Özdere Stream is aimed at providing irrigation for agricultural lands in the vicinity of the villages of Kösrelik, Körpınar, Kocabekir, and Mercimekören. The general and characteristic features of Aydıncık Kösrelik Pond are given in Table 2-4.

With the planned project, water from the Kösrelik Dam will be delivered to the irrigation area via main and secondary lines using a closed pressurized pipe system (HDPE100). This will enable the irrigation of a gross area of 597 hectares through gravity-fed sprinkler and drip-furrow irrigation systems. As a result, the application of modern irrigation methods using a 6220-meter-long pipeline network will enhance irrigation efficiency and coverage. This will allow for more effective water use and enable the irrigation of a larger area with the same amount of water.

The Kösrelik Pond Irrigation Supply Project, which will be implemented in the Özdere Stream area near the villages of Kösrelik, Körpınar, Kocabekir, and Mercimekören, aims to ensure that the agricultural lands in this area are irrigated more efficiently. The water source of Kösrelik pond is Özdere, which is located in the Yeşilırmak basin. Özdere originates from Yayla hill at 1300 m elevation. It then merges with several tributaries and takes the name Özdere. The rainfall area of Özdere at the axis of the pond is 34.7 km². Since there is no operational AGI on Özdere where the pond will be constructed, sporadic flow measurements are carried out by the water measurement teams of DSİ 12th Regional Directorate near the pond location of Özdere. The flows at the location of the pond were obtained by carrying the measurements made in proportion to the rainfall areas. As a result of the calculations and evaluations, Kösrelik pond location annual average flow rate was determined as 0.116 m³/s and Kösrelik pond Annual Average Water (AADW) = 3.164 hm³ by staying on the safe side.

The project will be carried out in accordance with the "Regulation on the Improvement of River and Stream Beds," published in the Official Gazette No. 27499 on February 20, 2010, and the "Flood and Sediment Control Regulation," published in the Official Gazette No. 30763 on May 3, 2019.

The Özdere Stream, which constitutes the project area, is located on the Çekerek-2 River, which is defined as a Sensitive River Water Body under the "Regulation on the Identification of Sensitive Water Bodies and Areas Affecting These Bodies and Improvement of Water Quality." The purpose of the said Regulation is to identify the sensitive water bodies in terms of nutrients and the urban and nitrate sensitive areas affecting these bodies in 25 river basins allocated throughout Türkiye, to set out the principles regarding this and to determine the necessary measures to be taken for the improvement of water quality in sensitive water bodies. In this context, River Basin Management Plan studies in these river basins have been completed in some basins and are ongoing in others.

Yeşilırmak River Basin Management Plan studies have been completed for the Yeşilırmak River Basin, where the Project area is located. The drainage network including the Çekerek River and its tributaries, where the Project area is located, has been defined as nitrate sensitive and urban sensitive areas under the TR14011421–Çekerek-2 Sensitive River Water Body Code. Within the scope of the Plan, it is proposed to implement measures to improve ecological and chemical parameters in these water bodies due to point and diffuse pollution sources such as urban discharges and leakages, industrial, mining and geothermal discharges, nutrient pollution from agriculture and animal husbandry, municipal waste dumping sites, mining sites, sewage sludge, etc. In general, good agricultural practices, erosion control, afforestation and rehabilitation are among the recommended measures.

The hydrological map of project area and its surrounding is given at Figure 5-7.

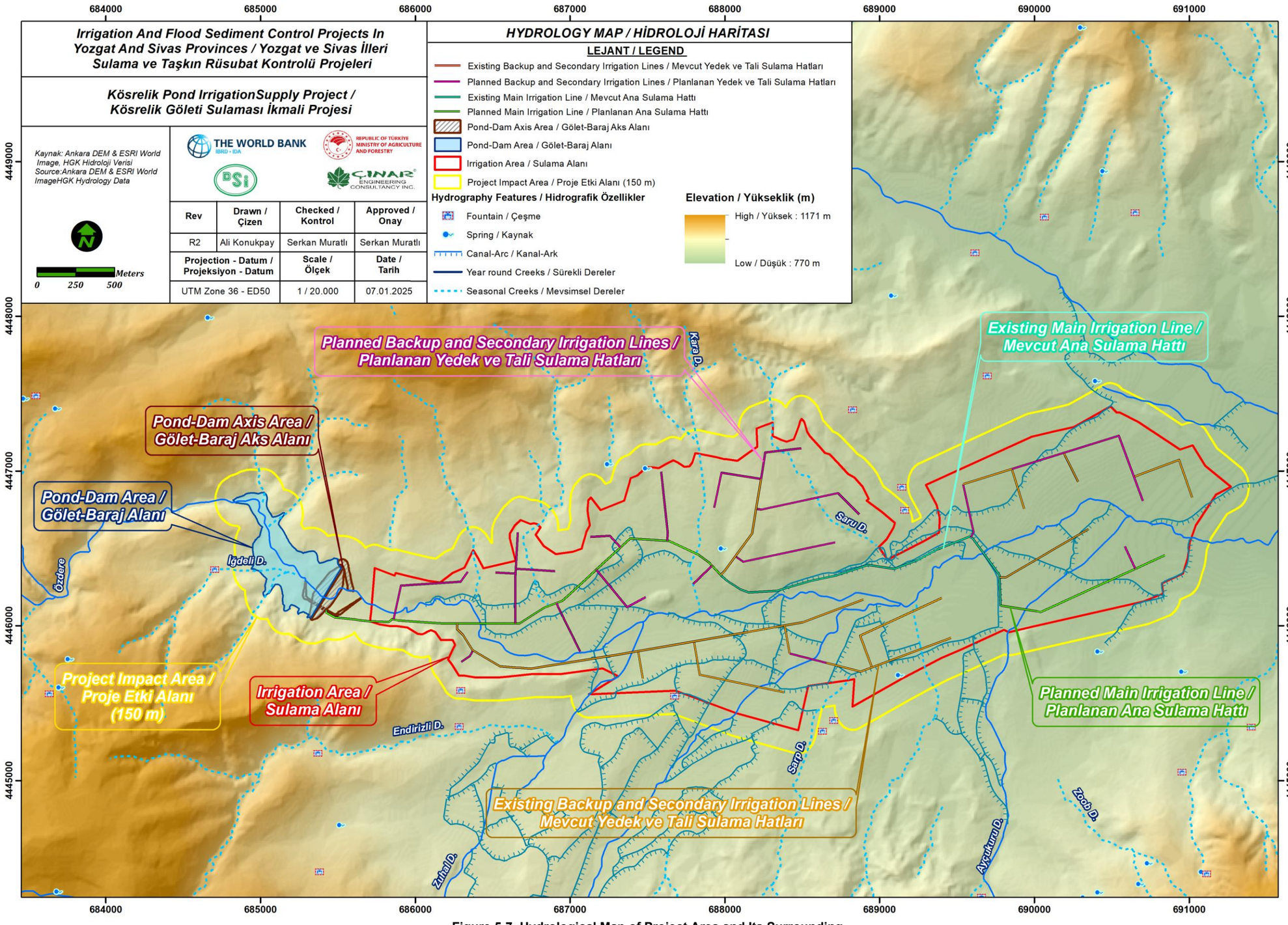

Figure 5-7. Hydrological Map of Project Area and Its Surrounding

5.5 Seismicity and Natural Disaster Potential

5.5.1 Seismicity

The renewed "Earthquake Hazard Map of Türkiye", published in the Official Gazette dated 18.03.2018 and numbered 30364 (duplicate) and entered into force as of 01.01.2019, is given in Figure 5-8 below and the project area is marked on. The project area was examined on the interactive earthquake hazard map published by AFAD, and the largest ground acceleration value (PGA 475) for the 475 Year Recurrence Period was determined as 0.220-0.225 g (see Figure 5-9).

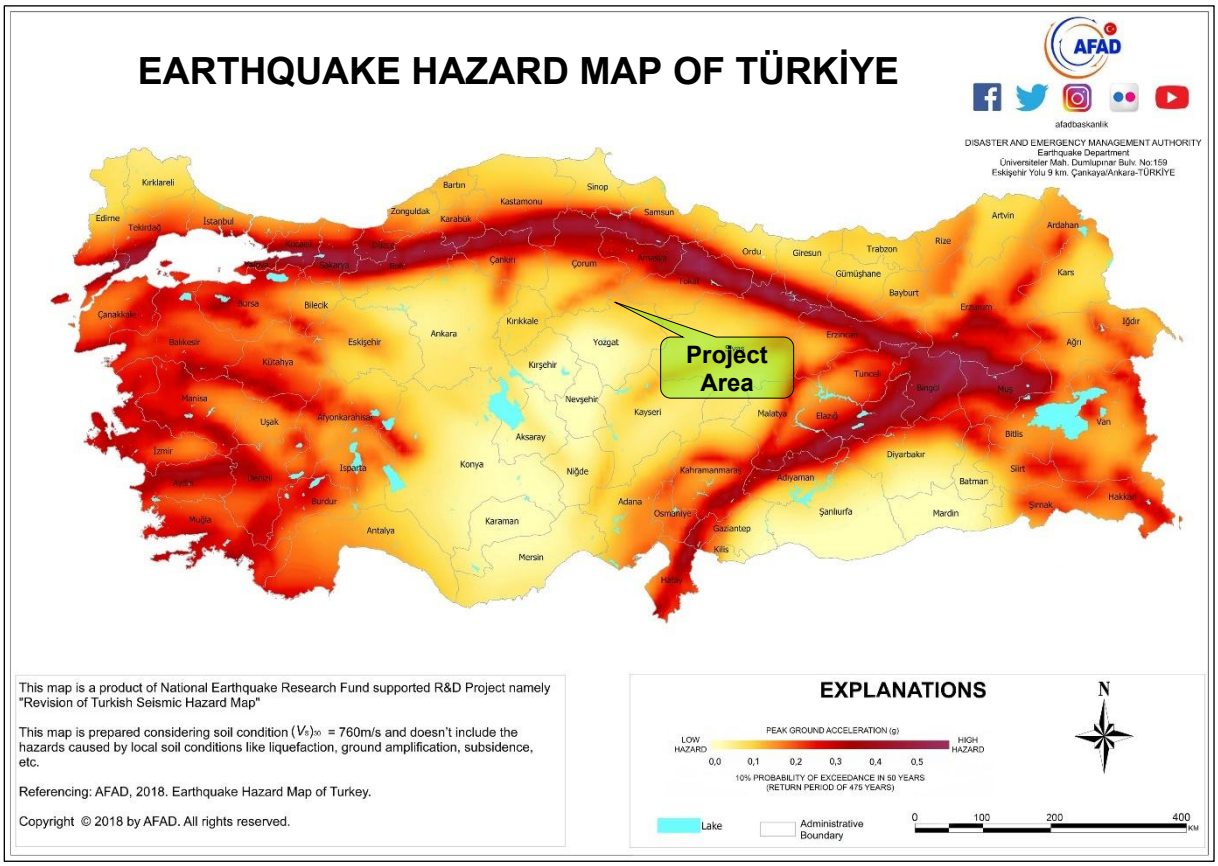

Figure 5-8. Earthquake Hazard Map of the Project Area[16]

There are three active faults around Yozgat province. These are Ezine Pazarı Fault, Deliler Fault, Kırıkkale Fault. It is known that the movements of these side fractures dampen as they move into Anatolia, but in places close to the main line, they have the potential to produce devastating earthquakes, albeit with low risk. The most important known movement on the North Anatolian Fault occurred in the 1939 Erzincan earthquake, and this line broke up to the Ezine Pazarı village, causing great damage in the region. Young fractures of the fault are observed in the alluvial fans in the region. After leaving the Deliçay valley, the Ezine Pazarı Fault divides into two branches, continuing towards Sungurlu (Sungurlu Fault) in the south and Mecitözü (Gökhöyük Fault) in the north. Due to the existence of these tributaries, the Geldingen Plain was opened as a pull-apart basin. When we look at the seismic activity in

[16] Source: AFAD,2018, Earthquake Hazard Map of Türkiye

the region, it is observed that the significant activity on the fault is concentrated mostly in the Mecitözü-Doğantepe line.

The faults affecting the project area and its vicinity should be considered in relation to the North Anatolian Fault, both due to their locations and the presence of lateral displacement components.

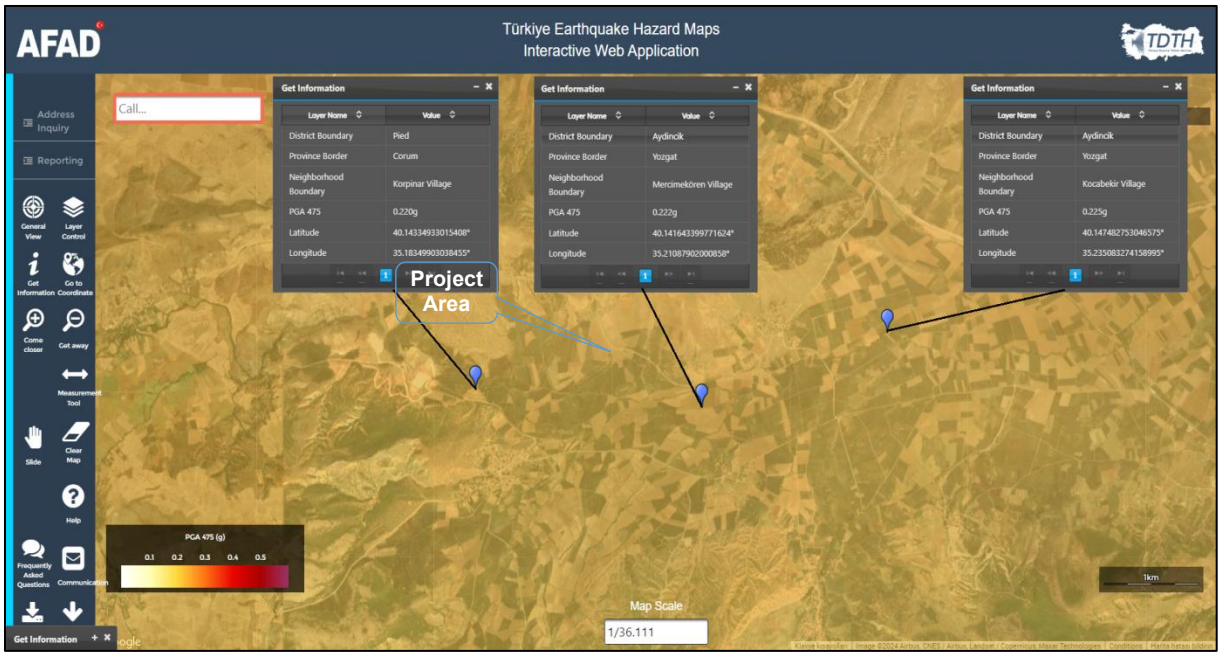

Figure 5-9. Project Area Peak Ground Acceleration[17] (PGA 475)

There is no documented historical (before 1900) earthquake record in Yozgat province. Yozgat was shaken by devastating earthquakes (after 1900) and suffered significant damage. In May 1923, a severe earthquake occurred in Central Anatolia and caused destruction in Tokat and Yozgat. In the earthquake on April 19, 1938, centered in Kırşehir, damage occurred in Yozgat, Kayseri, Eskişehir, Ankara and Çorum provinces. Earthquakes also occurred in Yozgat on 13 April 1940 and 29-30 July 1940. In the earthquake that occurred on 29-30 August 1940, 239 people died, 282 people were injured, 1312 buildings collapsed, 2503 buildings suffered major damage, 2554 buildings suffered minor damage, and 747 animals perished (Karayaman, 2016).

All kinds of structures to be built within the scope of the project must comply with the principles of the "Regulation on Buildings to be Built in Disaster Areas" published in the Official Gazette dated 14/07/2007 and numbered 26582 of the Repealed Ministry of Public Works and Settlement and published in the Official Gazette numbered 30364 dated 18.03.2018 and the provisions of the "Turkish Building Earthquake Regulation" of the Disaster and Emergency Management Presidency (AFAD), which came into force in published on 01.01.2019, will be strictly adhered to.

5.5.2 Floods, Landslides and Rockfalls

Due to the historical covering of rivers and streams that flow through and around settlements in Yozgat, the most common type of disaster in the province is flooding and water inundation.

[17] Source: Interactive Earthquake Risk Map, AFAD, (https://tdth.afad.gov.tr/)

Therefore, in planning and construction activities, it is crucial to ensure that developments are located away from stream beds. Additionally, technical solutions should be implemented to drain and evacuate water in sloped areas to prevent water inundation.

In Yozgat Province, among disaster events from the past to the present, landslides are the most common after meteorological events, with rockfalls occurring to a lesser extent and avalanches being very rare. Rockfalls, a type of mass movement disaster, are most frequently observed in the districts of Akdağmadeni, Kadışehri, Yenifakılı, and some smaller settlements within the central district. Another type of disaster, landslides, is observed in the central district of Yozgat as well as in the villages of Aydıncık, Çekerek, Yerköy, and Şefaatli districts.

Between 2010 and 2020, a total of 36 flooding and water inundation events, 12 landslides, and 6 rockfalls were recorded in the province.

5.6 Climate

The Köppen-Geiger map is globally used in climate studies. As shown in Figure 5-10, Yozgat province, where the Project area is located, is classified as Csb climate type (warm winter, warm summer, and arid climate) according to the Köppen Climate Classification rules[18]. According to this climate type, the average temperature for at least four months is higher than 10ºC and lower than 22ºC for all months.

[18] **Source:** MaF, GDoM, Climate of Türkiye According to Köppen Climate Classification, January 2016.
Link: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.mgm.gov.tr/FILES/iklim/iklim_siniflandirmalari/koppen.pdf

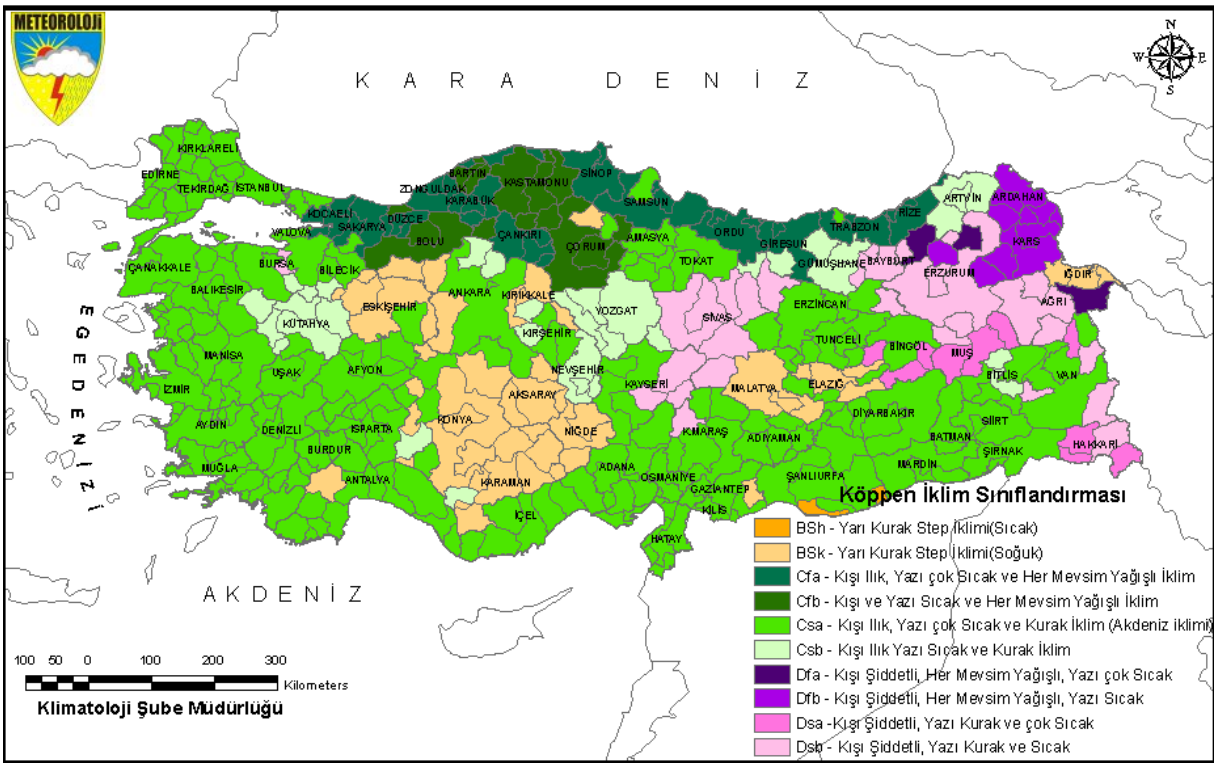

Figure 5-10. Türkiye's Climate According to Köppen Climate Classification[19]

The annual average temperature value is documented as 9.2 °C in Yozgat province, where the project area is located. The lowest average temperature was recorded in January as -5.3 °C, while the highest average temperature was documented in September as 26.6 °C. The lowest air temperature recorded in Yozgat province was -24.4 °C on 23 February 1985. The highest air temperature was recorded on July 30, 2000, as 42.6 °C[20].

According to the data received and recorded from the General Directorate of Meteorology (GDoM) measurement stations, the monthly average temperature values of Yozgat province are shown in Figure . The graph shows that the average temperature gradually increases from winter to spring and spring to summer and gradually decreases when transitioning to autumn. The highest average temperature value in Yozgat province was recorded in August as 19.8 ºC, followed by 19.6 ºC in July. The lowest average temperature value was recorded in January as -1.7 ºC and in February as -0.60 ºC.

[19] https://www.mgm.gov.tr/iklim/iklim-siniflandirmalari.aspx?m=YOZGAT
[20] https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?m=YOZGAT

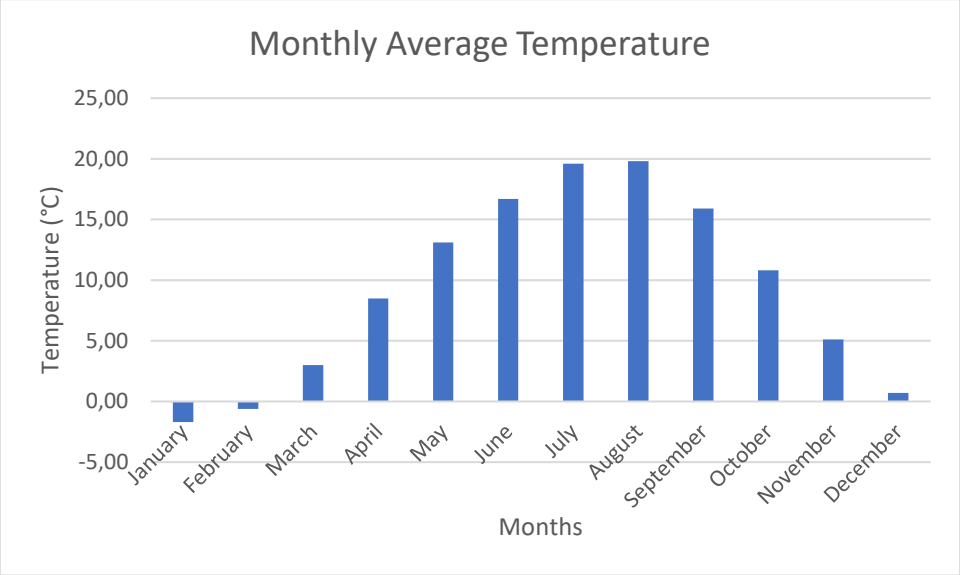

Figure 5-11. Monthly Average Temperature between 1929 and 2022 in Yozgat[21]

According to the data received and recorded from the measurement stations of the GDoM, the monthly average rainfall values for Yozgat province are shown in Figure 5-12. The graph shows that precipitation is high in autumn, winter, and the following spring seasons and that the average precipitation decreases with the summer season. The highest precipitation level in Yozgat province was recorded in December as 75.70 mm. The lowest rainfall level was recorded in August as 11.40 mm.

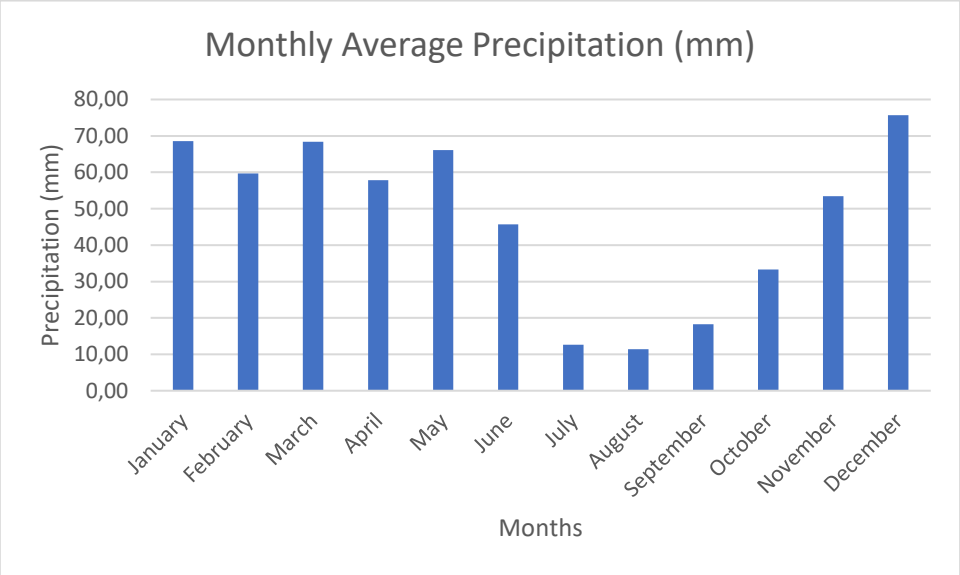

Figure 5-12. Monthly Average Precipitation between 1929 and 2022 in Yozgat[21]

The project area is located in Aydıncık district of Yozgat province. Summers in Yozgat are hot and dry and winters are cold and rainy due to being close to the sea effect. These harsh

[21] Data has been obtained from the following, and graphics are created accordingly: General Statistical Data for Our Provinces, Yozgat, General Directorate of Meteorology

climatic conditions soften a little in the Aydıncık district, which enters the Yeşilırmak basin, and Black Sea climate effects are seen to a lesser extent. Summer, which is hot and dry, is cool in the high plateaus. Winters are cold and rainy. The annual precipitation amount is 570 mm. Most of the precipitation in the district falls in spring, autumn and at the beginning of summer (June). The common vegetation is steppes. The mountains, which are bare in most places, are covered with oak forests around the district center[22].

Aydıncık, Yozgat province, has a continental climate with hot, dry summers (20°C to 35°C) and cold winters (often below 0°C). The region receives around 450-500 mm of annual precipitation, mostly in spring and autumn, while summers are typically dry. Humidity is moderate to low, and winds are generally mild. The area enjoys abundant sunshine in the summer but experiences frost in the winter, affecting agricultural activities.

5.7 Air Quality

There are two (2) ambient air quality measurement stations in Yozgat province, where the Project area is located namely “Yozgat Air Quality Monitoring Station” and “Yozgat-Sorgun Air Quality Monitoring Station”. Information about air quality stations is given in Table 5-5.

Table 5-5. Information About Yozgat Province Air Quality Monitoring Stations[23]

Station Name	Coordinates	Parameters	Date
Yozgat	34.8057, 39.8182	PM_{10}, $PM_{2.5}$, SO_2, NO_x, NO, NO_2, CO	24.05.2006
Yozgat-Sorgun	35.1816, 39.8062	PM_{10}, $PM_{2.5}$, SO_2, CO	

Yozgat station is 45 km away, and Yozgat-Sorgun station is 33 km from the project area. Figure 5-13 shows the location and instantaneous air quality index of two (2) monitoring stations in Yozgat province in the National Air Quality Monitoring Network published on the website of the MoEUCC. According to station information, the PM_{10} parameter is generally defined as “good”[24] below the 50 µg/m^3 limit value in the Yozgat region.

[22] General Information on Kadışehri. Yozgat Special Provincial Administration webpage: http://yozgatozelidare.gov.tr/kadisehri-genel-bilgi#:~:text=Karasal%20iklime%20sahip%20olmakla%20birlikte,K%C4%B1%C5%9Flar%C4%B1%20ise%2C%20so%C4%9Fuk%20ve%20ya%C4%9F%C4%B1%C5%9Fl%C4%B1d%C4%B1r.

[23] National Air Quality Monitoring Network of Ministry of Environment, Urbanization and Climate Change.

[24] **Good**: The air quality is good.
”**Medium**: The air quality is suitable, but sensitive groups may be moderately affected by air pollution.
Sensitive: Health effects may occur for sensitive groups. The public is not expected to be affected.
Unhealthy: Sensitive groups may experience serious health effects. The public is likely to experience some health effects.
Poor: The entire population is likely to be affected by air pollution and sensitive groups should limit outdoor activities.
Hazardous: Anyone may experience serious health effects. Outdoor activities should be avoided.
(according to air quality index defined in https://sim.csb.gov.tr/SERVICES/airquality).

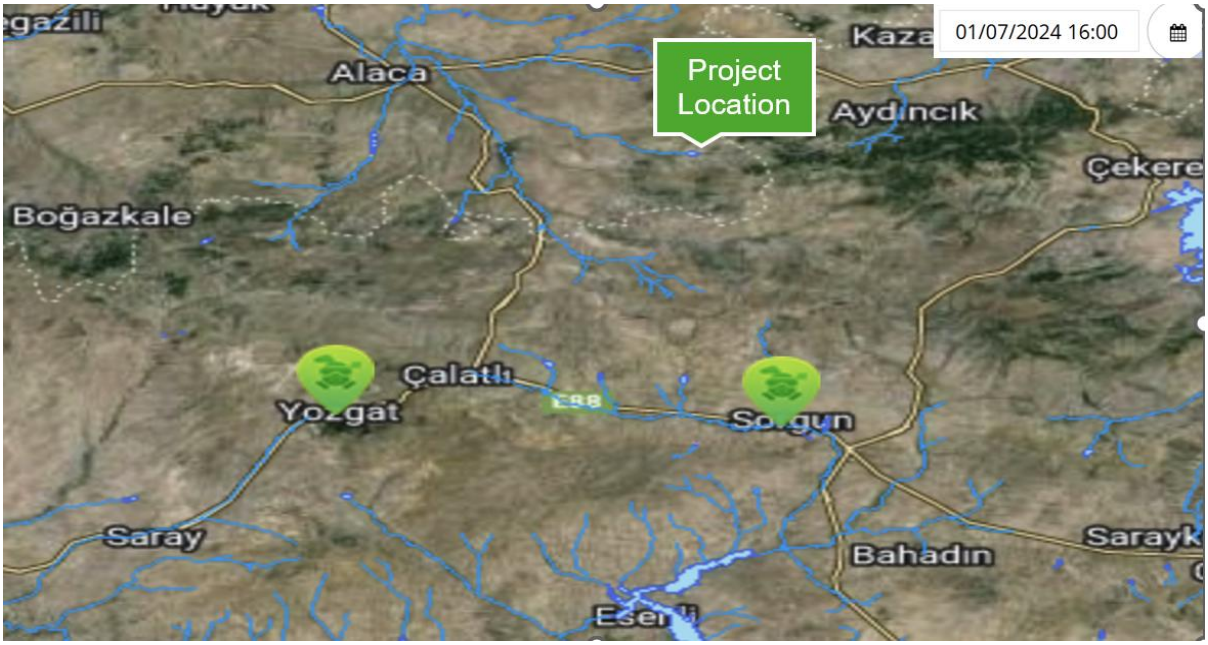

Figure 5-13. Locations of Ambient Air Measuring Stations in Yozgat Province[23]

The station Yozgat located in the center was initially established in Taşköprü neighborhood on 24.05.2006. The station was established to detect pollution caused by heating, and measurements of PM, CO, NO_x, NO_2, NO and SO_2 parameters are measured. The Yozgat Air Quality Monitoring Station's location was changed in 2019, and the station's current location is adjacent to the children's park and surrounded by buildings. Considering the station's residential area in the deepest part of the city, the roads around it are paved with interlocking parquet, and the Ankara-Yozgat-Sivas Highway passes 200 meters away. There are no industrial facilities around the station. Yozgat Çamlık National Park is located 1 km south of the station. There are no extensive industrial facilities in the city center. Air pollution occurs when air circulation is low in the winter with the temperature decreases.

The station established in Sorgun is located next to the school garden between Şefaatli Street and Mevlana Street in Karşıyaka neighborhood. PM, CO, O_3 and SO_2 parameters are measured at Sorgun station.

Regulation on Air Quality Assessment and Management and IFC EHS Guidelines Air Quality Limit Value are given in Table 5-6 and Table 5-7 respectively.

Table 5-6. Regulation on Air Quality Assessment and Management-Air Quality Limit Values[25]

Pollutant	Average Time	Limit Value (µg/m^3)
SO_2	Hourly - for the protection of human health-	350*
	Daily - for the protection of human health-	125**
	Annual and Winter Season (from 1 October to 31 March) -for the protection of ecosystem-	20
NO_2	Hourly	200***
	Annual	40

[25] Regulation on Air Quality Assessment and Management

Pollutant	Average Time	Limit Value (µg/m³)
Particulate Matter PM_{10}	Daily	50****
	Annual	40

* not to be exceeded for more than 24 times in a year
** not to be exceeded for more than 3 times in a year
*** not to be exceeded for more than 18 times in a year
**** not to be exceeded for more than 35 times in a year

Table 5-7. IFC EHS Guidelines-Air Quality Limit Values[26]

Pollutant	Averaging Period Time	Guideline Value (µg/m³)
SO_2	24-hour 10-minute	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline)
NO_2	1-year 1-hour	40 (guideline) 200 (guideline)
Particulate Matter PM_{10}	1-year 24-hour	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $PM_{2.5}$	1-year 24-hour	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour Daily maximum	160 (Interim target-1) 100 (guideline)

In cases where national regulatory requirements in Türkiye differ from the levels and protection measures presented in IFC's EHS Guideline, the stricter limit value in the project specification will prevail and will be referred to as the project standard in this report.

Table 5-8 presents the monthly average SO_2 concentrations recorded at Yozgat Station and Yozgat-Sorgun Station between 01.07.2023 and 01.07.2024, and the number of days when the limit values were exceeded.

Table 5-8. Monthly Average SO_2 Concentrations and Limit Exceed Days per Month[27]

Months	Yozgat Station (µg/m³)	Limit Exceed Days	Yozgat-Sorgun Station (µg/m³)	Limit Exceed Days
July	5.85	0	7.92	1
August	5.86	0	6.12	0
September	6.12	0	3.18	0
October	6.60	0	11.77	1

[26] IFC EHS Guidelines-Air Quality
[27] The data has been derived from the National Air Quality Monitoring Network of Ministry of Environment, Urbanization and Climate Change, and then the average values are calculated.

Months	Yozgat Station (µg/m³)	Limit Exceed Days	Yozgat-Sorgun Station (µg/m³)	Limit Exceed Days
November	7.33	0	9.11	0
December	10.91	0	10.75	1
January	7.24	0	17.76	3
February	9.19	0	16.47	1
March	6.38	0	16.28	3
April	6.83	0	15.69	0
May	1.43	0	16.06	0
June	1.95	0	6.99	0

Analyzing the data in Table 5-8, it is seen that the monthly average SO_2 concentration values at Yozgat Station are below the limit value and no daily exceedances are recorded, while the monthly average SO_2 concentration values at Yozgat-Sorgun Station are higher and daily exceedances are recorded. While the lowest SO_2 value at Yozgat Station is 1.43 µg/m³ in May, this value increases to the highest average value of 10.91 µg/m³ in December. While the lowest SO_2 value at Yozgat-Sorgun Station is 3.18 µg/m³ in September, this value increases to 17.76 µg/m³ in January. As a result, SO_2 concentration values increase in both stations in the fall and winter months.

The comparison of monthly average SO_2 concentration values measured at the Yozgat and Yozgat-Sorgun stations are given in Figure 5-14.

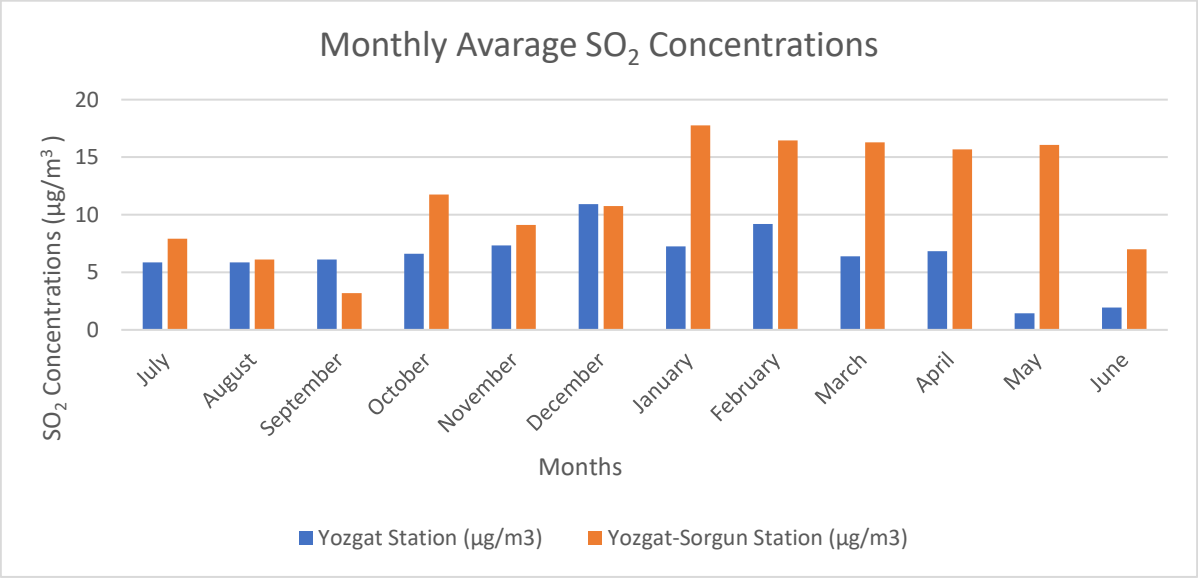

Figure 5-14. Monthly Average SO_2 Concentrations[27]

As can be seen in Figure 5-14, fluctuations are observed in both stations. While there is a decrease in SO_2 concentration values from summer months to winter months (from May to September) at Yozgat Station, there is an increase at Yozgat-Sorgun Station. This may be due to the higher traffic density caused by the presence of small-scale industries in the region where Yozgat Station is located. SO_2 concentration values increased in the fall and winter months (from September to January) at Yozgat and Yozgat-Sorgun stations. This increase may be since cold air prevents atmospheric dispersion in winter months. The locations of the two stations are also located within the settlement. Therefore, exhaust

emissions containing SO_2 resulting from traffic activities are dispersed upwards from the ground in the summer months due to the effect of warm weather conditions. However, this situation causes the pollutant concentrations not to disperse upwards from the ground due to the cooling of the air in winter months and consequently the decrease in atmospheric dispersion. For this reason, lower concentrations were recorded at both stations in summer compared to winter months. Due to the use of many constructions equipment during construction works in the Project area, exhaust emissions containing SO_2 from traffic will be emitted to the atmosphere. The timing of construction activities in the fall and winter months may cause a short-term increase in SO_2 concentration at ground level. However, this increase will be limited to the construction period.

Table 5-9 presents the monthly average PM_{10} concentrations recorded at Yozgat Station and Yozgat-Sorgun Station between 01.07.2023 and 01.07.2024, and the number of days when the limit values were exceeded.

Table 5-9. Monthly Average PM_{10} Concentrations and Limit Exceed Days per Month[28]

Months	Yozgat Station (µg/m³)	Limit Exceed Days	Yozgat-Sorgun Station (µg/m³)	Limit Exceed Days
July	30.11	0	31.76	1
August	36.02	1	45.98	6
September	43.86	8	34.78	1
October	61.31	20	60.53	12
November	50.21	15	48.49	13
December	40.99	11	54.09	19
January	23.59	0	30.38	5
February	43.29	6	49.42	12
March	64.15	8	42.28	8
April	38.73	0	55.90	10
May	31.68	3	37.52	10
June	37.71	5	28.24	5

Analyzing the data in Table 5-9, it is seen that the monthly average PM_{10} concentration values at both stations are generally surround on the 30-60 µg/m³ all the year. The number of days exceeding the limit was recorded at both stations, but this number of exceeding did not exceed the value specified in the legislation. While the lowest monthly average PM_{10} value at Yozgat Station was recorded in January with 23.59 µg/m³, the highest monthly average PM_{10} value was recorded in March with 64.15 µg/m³. While the lowest monthly average PM_{10} value at Yozgat-Sorgun Station was recorded in June with 28.24 µg/m³, the highest monthly average PM_{10} value was recorded in October with 60.53 µg/m³. An increase in PM_{10} concentration values is observed from winter to spring at both stations. These transitions are more fluctuating at Yozgat-Sorgun Station compared to Yozgat Station.

The comparison of monthly average PM_{10} concentration values measured at the Yozgat and Yozgat-Sorgun stations are given in Figure 5-15.

[28] The data has been derived from the National Air Quality Monitoring Network of Ministry of Environment, Urbanization and Climate Change, and then the average values are calculated.

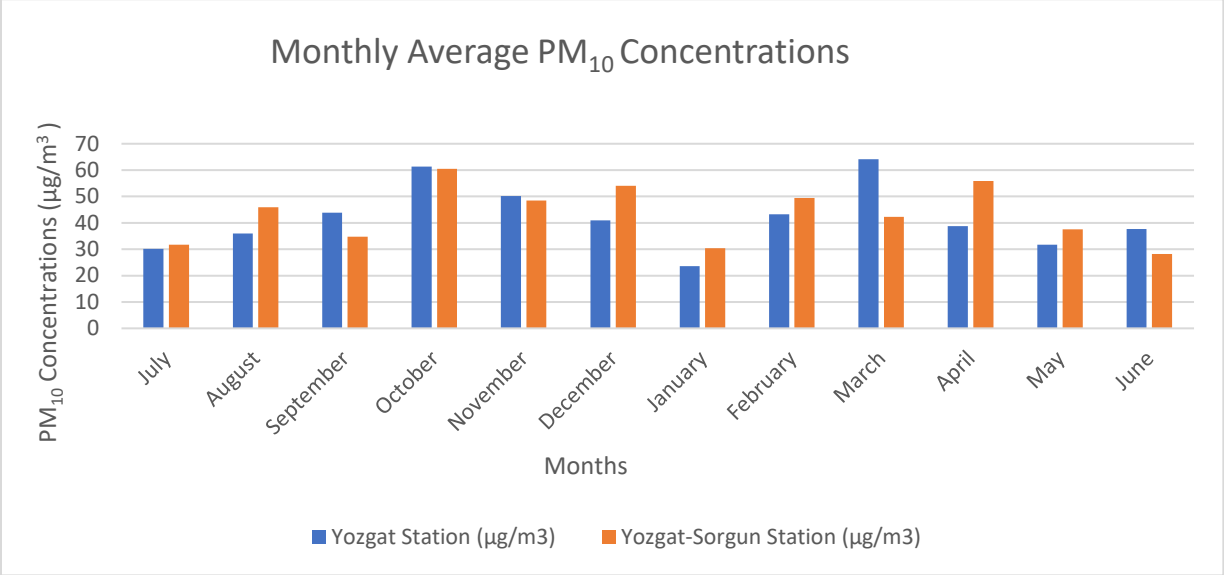

Figure 5-15. Monthly Average PM_{10} Concentrations[28]

Table 5-9 and Figure 5-15 presents monthly air pollutant concentrations (µg/m³) and the number of days these levels exceeded the limit at Yozgat-Merkez and Yozgat-Sorgun stations. At Yozgat Station, pollutant levels peak in October (61.31 µg/m³) and March (64.15 µg/m³), with significant exceedance days in the fall and early winter. Yozgat-Sorgun Station shows a similar trend, with high levels in October (60.53 µg/m³) and December (54.09 µg/m³), and frequent exceedance days, especially in winter and early spring. This indicates that both stations experience poorer air quality during colder months, highlighting the need for enhanced air quality control and health risk mitigation during these periods.

As can be seen in Figure 5-15, fluctuations are observed in Yozgat-Sorgun Station. While PM_{10} concentration values at Yozgat Station decreased in winter months, values recorded at Yozgat-Sorgun Station in December and February showed an increase. This may be due to construction activities conducted in Sorgun region during those periods, use of wood and coal for heating or traffic emissions. PM_{10} concentration values increased at Yozgat Station in summer months, while they decreased at Yozgat-Sorgun Station in May and June.

Air pollution in Yozgat province is generally caused by traffic activities, but small-scale industrial establishments can also be mentioned in the region. In addition, due to the geographical structure of Yozgat province, there are mountains around the district centers that will prevent atmospheric distribution. Since the project area is located within the geographical structure of Yozgat province, it will have similar characteristics. The presence of flat agricultural areas along the project route is noticeable. Dust and exhaust emissions from construction activities will have a low impact on the local population and agricultural areas in the short term.

The excavation activities in the Project will be carried out in short, focused bursts in specific areas rather than over a prolonged period during the construction phase of the Project. In addition, the Project area is a rural area and there are no significant dust sources such as mining activities, large construction activities, etc. Dust emissions are currently generated mainly from farming activities and the movement of agricultural vehicles in certain seasons.

Because these excavation works are brief and localized, it is foreseen that baseline measurement work will not be necessary in the project impact area. Since the excavation is short-term and has limited impact, it is assumed that baseline measurements might not provide significant or useful information in this context.

During the operation phase of the material quarries, exhaust gas emissions and dust will be generated. Emissions will be long-term due to the process. Emission quantities and characteristics have been calculated for F-1 Permeable Material Quarry and K-1 Rock Material Quarry in the Project Introduction File. Accordingly, the mass gas emission flow rates that will be released in these quarries were compared with the limit values given in Annex-2 Table 2.1 of the Industrial Air Pollution Control Regulation (IAPCR). The mass gas emission flow rates that will occur in these quarries are below the limit values.

In addition, dust emissions have also been calculated for the quarries. Accordingly, the mass dust flow rate calculated for F-1 Permeable Material Quarry is below the limit value ("1 kg/hour") given in the IAPCR. However, since the mass dust flow rate calculated for K-1 Rock Material Quarry is above this limit value, the Contribution Value to Air Pollution was calculated using the Gaussian Dispersion model. When the settled dust distribution obtained as a result of the dust modeling is examined, it is seen that the amount of dust settled in all directions falls below the limit value of 450 µg/m^{2}day.

While the gas emission values calculated in the Project Introduction File for the Limestone Material Quarry are below the limit values of IAPCR, the dust emission values are above the limit value of 1 kg/hour. Therefore, air quality dispersion modeling was performed for dust emission. The modeling results were compared with the limit values given in the Air Quality Assessment and Management Regulation and it was seen that the limit values were met. The details are given in Appendix-4. So, it is assumed that baseline measurements might not provide significant or useful information in this context.

5.8 Noise

The summary of the activities to be conducted within the scope of the Project is given below:

- Excavation works for the irrigation pipelines
- Installing pipes to underground
- Refilling the excavated areas and restoring the land to its former state.

In this context, it is considered that noise generation will occur mainly during the excavation process. Noise generation will occur for short periods in limited areas for the Project.

The construction activities will be conducted in short periods and consecutively, and mostly on the agricultural lands. For this reason, it is considered that no noise baseline measurement is required. It is recommended that excavation work in places close to the residential area be conducted during local people's working hours (weekdays/daytime). In case of complaints, noise measurements will be made.

In addition, there will be increased noise from construction equipment working in the material quarries and vibration and noise from blasting in the rock quarry. Noise calculations for material quarries and vibration assessment for rock quarries are provided in Section 7.2.6.

During the operation phase of the material quarries, noise and vibration will be generated from work machinery and blasting operations. Noise and vibration caused by blasting will be short term. Blasting will be carried out at the K-1 Rock Material Quarry and Limestone Quarry. There will be no blasting in the F-1 Permeable Material Quarry. Approximately 2-3 blasting will be carried out per month and approximately 31 blasting will be carried out annually for rock quary, while approximately 25 blasting per year will be performed for limestone quarry.

The limit values to be complied with during the construction and operation phases of the Project are given below.

Regulation on Environmental Noise Control and IFC EHS Guidelines Noise Limit Value are given in Table 5-10 and Table 5-11 respectively.

Table 5-10. Regulation on Environmental Noise Control-Noise Limit Values[29]

Noise Source	Measured Parameter	Environmental Noise Level (dBA)		
		Daytime	Evening	Night
Industrial facilities, transportation sources	$LA_{eq,5min.}$	65	60	55

Table 5-11. IFC EHS Guidelines-Noise Limit Values[30]

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime	Evening
Residential; institutional; educational	55	45
Industrial; commercial	70	70

During the construction phase of the Project, there will be no work during night hours. Therefore, the limit values are compared with daytime time intervals. Where Turkish national regulatory requirements differ from the levels and safeguards presented in IFC's EHS Guidelines, the more stringent limit value in the project specification will apply. Since the sensitive receptors of the project are the residences of the village, the IFC EHS Guideline value, which is the most stringent limit value, has been selected as the limit value. Therefore, the project standard was selected as 55 dBA.

There are neighboring houses and a village road around the Project area. Since the area is a rural area, there are no significant noise sources such as industrial activities or dense traffic. The existing noise level is mostly related to agricultural activities such as the use of tractors, combine harvesters, etc. and is negligible. During the site visit carried out within the scope of ESMP preparation, no adverse noise level impacts on sensitive receptors were observed in the Project area.

5.9 Water, Wastewater and Waste Infrastructure

5.9.1 Water

There are two rivers within the borders of Yozgat Province, Delice River and Çekerek River. While the Delice River flows with a flow rate of 450 hm^3/year in an area of 576 hectares, the Çekerek River flows with a flow rate of 430 hm^3/year in an area of 350 hectares.

There is no natural lake within the provincial borders, but there are a total of 5 dams. According to the information provided in the Provincial Environmental Status Report, 2 of these dams are currently actively used. In addition, there are 4 irrigation ponds currently in operation belonging to DSI in the province. According to the information received from DSI, data on water resources are summarized in Table 5-12.

Table 5-12. Water Resources of Yozgat Province[13]

Name	Type	Irrigation Area (ha)	Remark
Uzunlu	Dam	3,047	Irrigation and Flood control, under maintenance

[29] Regulation on Environmental Noise Control
[30] IFC EHS Guidelines - Noise

Name	Type	Irrigation Area (ha)	Remark
Yahyasaray	Dam	155	
Gelingüllü	Dam	2,355	
Musabeyli	Dam	259	Irrigation has not started yet
DSI ponds	Irrigation pond	437	
Fehimli	Irrigation pond	192	
Kanlıdere	Irrigation pond	12	
Kirazlı	Irrigation pond	6	
Kuzayca	Irrigation pond	177	
Şefaatli Gülistan	Irrigation pond	50	
Yozgat Merkez Büyükmahal	Irrigation pond	-	Under construction
Sorgun Gülşehri – Hoşumlu	Irrigation pond	-	Under construction

The Provincial Environmental Status Report of Yozgat states that the groundwater potential of Yozgat is estimated as 360.82 hm^3/year.3.68 hm^3 of water is used to irrigate 490 ha of land through three Soil Water Cooperatives. Out of the 92 hm^3 of groundwater that can be safely used, only 30.51 hm^3 has been allocated, the remaining 61.49 hm^3 unallocated.

There are also hot water springs in Sarıkaya, Boğazlıyan Bahariye, Sorgun, Yerköy, Saraykent, Akdağmadeni and Karadikmen in the Yozgat region. These hot waters are utilized for heating and spa purposes.

The amount and quality of groundwater vary depending on the geological conditions of the region. In the Boğazlıyan sub-basin, where intensive irrigation is carried out, the water level is about 90 meters during droughts and 60 meters during rainy seasons. This region is the only one with a flat terrain, and the groundwater level varies locally between 10 meters and 120 meters.

5.9.1.1 Çekerek Basin

Çekerek Stream is formed by the joining together of small streams that originate from the Kızık, Dinar, Çalı and Kavak hills, near Çamlıbel district. Çekerek Stream is approximately 276 km in length. The stream joins the Yeşilırmak River near Kayabaşı.

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. This basin area covers approximately 1,165,440 ha, which is about 1.5% of Türkiye's total area.

In Çekerek Basin, while surface water is generally used for irrigation, groundwater is used for 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.

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 m. The sandy gravelly levels of alluvium

generally start after 2 - 3 m of soil cover. Groundwater sources in the Çekerek Basin for Yozgat districts are provided in Table 5-13. As seen in the table, 1.42 hm^3/year water drawn from the Çekerek River within Aydıncık District[31].

Table 5-13. Groundwater sources of Çekerek Basin in Yozgat province[32]

Districts	Amount of Water Drawn from Çekerek River (hm^3/year)
Aydıncık	1.42
Çekerek	2.27
Kadışehri	0.99
Akdağmadeni	1.84
Sorgun	1.82

The surface water source drawn for urban water supply in Yozgat province is Kirazlı pond. There is a drinking water treatment plant with a capacity of 3000 m^3/day, which was commissioned by Yozgat Municipality in 1985, and all of the water coming out of the facility is given to the network and used for domestic purposes. According to TurkStat data, the amount of surface water withdrawn is 2648 m^3/year in total. 10% of the population's water needs are met from this pond.

90% of the water needed by the population in the city center has been supplied from 10 wells in the Çatalkaya Stream basin, located on the Alaca border of Çorum province, since 1999, and from 14 wells in the Eğriöz Stream basin, parallel to the highway in Sorgun district of Yozgat province, since 1983. The water collected from the wells is pumped from 40 km away and brought to the city, chlorinated and given to the water network.

The rivers in Çorum are located in the basins of Kızılırmak and Yeşilırmak, the two most important rivers in the country. Most of the streams and creeks in Çorum Central District, Alaca District, Mecitözü and Ortaköy Districts flow into Çekerek River which is an important tributary of Yeşilırmak. The rivers, dams and ponds in the province and their characteristics[33] are summarized in Table 5-14.

Table 5-14. Surface Water Characteristics of Çorum Province

Surface Waters – Streams					
No	**Name**	**Total Length (km)**	**Length within the Province (km)**	**Flowrate (m^3/sec)**	**Utility Purpose**
1	Kızılırmak	1355	182	137.5	Irrigation and Energy Generation
2	Delice Brook	305	71	23.647	Irrigation
3	Devrez Brook	186	11	5.158	Irrigation
4	Çorum Brook (Derinçay-Alaca Stream)	119	93	7.20	Irrigation
5	İncesu (Çekerek Stream)	256	16	25.817	Irrigation
Surface Waters – Dams					
No	**Name**	**Type**	**Volume (m^3)**	**Net Irrigation Area (ha)**	**Utility Purpose**

[31] Environmental and Social Framework of TULIP.
[32] DSI, 2016. Yeşilırmak Basin Master Plan Final Report.
[33] Çorum Provincial Environmental Status Report, 2023

1	Yenihayat	Dam	26635000	-	Drinking
2	Çorum	Dam	6470000	480	Drinking
3	Alaca	Dam	12560000	1698	Irrigation
4	Hatap	Dam	12369000	1036	Drinking and Irrigation
5	Koçhisar	Dam	159760000	7567	Drinking and Irrigation
6	Obruk	Dam	661115000	5584	Irrigation and Energy Generation
Surface Waters – Ponds					
1	Ahmetoğlan	Pond	200000	28	Irrigation
2	Evciyenikışla	Pond	320000	53	Irrigation
3	Geven	Pond	550000	23	Irrigation
4	Höyük	Pond	300000	90	Irrigation
5	Bozdoğan	Pond	600000	54	Irrigation
6	Sincan	Pond	680000	94	Irrigation
7	Aksu	Pond	230000	39	Irrigation
8	Gökçedoğan	Pond	630000	110	Irrigation
9	Geykoca	Pond	340000	100	Irrigation
10	Hıdırlık	Pond	610000	129	Irrigation
11	Pınarlı	Pond	220000	50	Irrigation
12	İnegazili	Pond	240000	35	Irrigation
13	Seydim I	Pond	730000	-	Drinking
14	Seydim II	Pond	1010000	-	Drinking
15	Kızkaraca	Pond	1000000	269	Irrigation
16	Köprübaşı	Pond	8780000	2587	Irrigation
17	Evci	Pond	6700000	1014	Irrigation
18	Daniş	Pond	590000	133	Irrigation
19	Figani	Pond	1250000	-	Irrigation
20	İncesu	Pond	3620000	-	Irrigation
21	Kozören	Pond	1100000	-	Irrigation
22	Kunduzlu	Pond	690000	-	Irrigation
23	Derekargın	Pond	1170000	-	Irrigation
24	Oğuzlar	Pond	560000	-	Irrigation
25	Aşağıfındıklı	Pond	560000	-	Irrigation

As for the groundwater resources, there are 4 facilities utilizing hot water resources within the provincial borders and these are Anvatar Thermal Facility, Hamamlıçay Village Hot Spring, Figani Beke Hot Spring and Melik Battal Facility. Groundwater potential in Çorum province is given in Table 5-15 together with basin name and other characteristics.

Table 5-15. Grounwater Features in Çorum Province[33]

No	Name of the Sub-basin	Allocated (hm^3/year)	Quality Class of the Groundwater		Pesticide and Fertilizer Use	Animal Breeding	Other
			Good	Weak			
1	Alaca basin	4	x				
2	Derinçay (downstream) basin	3.5		x	x	x	Salinity due to gypseous geological units

No	Name of the Sub-basin	Allocated (hm^3/year)	Quality Class of the Groundwater		Pesticide and Fertilizer	Animal Breeding	Other
3	Derinçay (upstream) basin	12.5		x	x	x	
4	Çorum River-Efendik basin	1.6	x				
5	Ortaköy-Göynücek basin	0.4	x				
6	Merzifon-Gümüşhacıköy basin	4.3	x				
7	Delice (İnegazili-Kavşut) basin	1.5		x			Salinity due to gypseous geological units
8	Çavuşçayı basin	0.5		x			Salinity due to gypseous geological units
9	Budaközü (Sungurlu) basin	5.4	x				
10	Budaközü (Demirşeyh) basin	0.6	x				
11	Budaközü (Boğazkale) basin	3.2	x				
12	Kızılırmak (Uğurludağ) basin	1.8		x			Salinity due to gypseous geological units
13	İskilip-Bayat basin	1.5	x				
14	Bayat-Kızılırmak basin	0.2		x			Salinity due to gypseous geological units
15	Kızılırmak-Ovacıksuyu basin	6.7	x				
16	Hamamönü basin	0.8	x				
17	Osmancık Doğusu basin	0.3	x				
18	Kargı basin	3.6	x				

According to the data obtained from DSI observation wells and private wells, groundwater levels vary greatly in 18 groundwater basins in Çorum province depending on hydrogeological, meteorological and topographical conditions and water use. According to 2018 measurements, groundwater levels vary between 0.10-16 meters in alluvial aquifers and between 16-90 meters in aquifers located in slope lands, especially depending on the elevation.

The water source of Kösrelik Pond, which is the associated facility of the Project, is Özdere stream, located in Yeşilırmak basin number 14. The Pond takes its name from Kösrelik village because it is located near it. The Stream rises from Yayla hill at 1300 m elevation, later it merges with several tributaries and takes the name Özdere. The precipitation area of Özdere stream at the pond axis is 34.7 km^2. Moreover, there is no existing or planned groundwater irrigation within the Project AoI[6].

In the interviews with the mukhtars of Kösrelik, Körpınar, Mercimekören and Kocabekir, it was stated by the mukhtars that the water needs of the villages are met from groundwater source near the Özdere stream bed (see Table 5-16). The water network line is connected to the houses in the villages.

Table 5-16. Water usage features of the Project villages

Village	District	Province	Water Usage	
			Utility	Irrigation
Kösrelik	Aydıncık	Yozgat	Groundwater	Özdere Stream
Kocabekir	Aydıncık	Yozgat	Groundwater	Özdere Stream

Village	District	Province	Water Usage	
			Utility	Irrigation
Mercimekören	Aydıncık	Yozgat	Groundwater	Özdere Stream
Körpınar	Alaca	Çorum	Groundwater	Özdere Stream

5.9.2 Wastewater

97% of the province, which has a central population of 79,240 people, benefits from the urban sewage system of Yozgat Municipality. All of the wastewater collected by the sewage system (average 18000 m^3/day) is treated in the Yozgat Municipality wastewater biological treatment facility, which was commissioned in 2006, and discharged into Baltaözü Stream. The capacity of the facility is 24000 m^3/day and the amount of discharged water is 0.210 m^3/sec. The amount of treatment sludge generated in the facility is 1.2 tons/day and this sludge is disposed of in the Yozgat Municipality Solid Waste Regular Storage Area in Salmanfakılı village.

According to information obtained from the mukhtars of Kösrelik, Körpınar, Mercimekören and Kocabekir, domestic wastewater is collected in permeable septic tanks located for each house or located in the village center. In addition, it was stated by the mukhtars that some of the wastewater is mixed into the Özdere Stream due to its permeable structure. Since the septic tanks are permeable, they are not filled up.

As no Project wastewater can be left untreated, impermeable septic tank(s) will be used in the Project scope, and those will be emptied by licensed vacuum trucks and sent to the closest licensed wastewater treatment plant (WWTP).

The licensed WWTPs within Yozgat province listed in Table 5-17 have been examined. Since there is no licensed wastewater treatment plant (WWTP) within the Aydıncık District, the closest WWTP, which is the Çekerek WWTP, will be used within the scope of the Project. The Contractor will make an agreement or a protocol with the Çekerek WWTP for receiving and treating the wastewater to be generated within the scope of the Project.

The Çekerek WWTP[34], with a capacity of 3,168 m^3/day, was put into operation on 27.07.2023, and the long aeration activated sludge process stages are as follows:

- coarse grills
- fine grids
- sand and oil trap
- anaerobic pool
- aeration pool
- main distribution and distribution structure
- return cycle and excess sludge lifting center
- sedimentation tank
- decanter (sludge dewatering)
- drum filter
- UV Unit
- odor removal unit

The Çekerek WWTP will be used within the scope of the Project. Çekerek WWTP currently has an Environmental Permit Certificate obtained on 15 May 2024 with a certificate no of 1526368046.0.1 on wastewater discharge, and it is valid until 15.05.2029. The satellite

[34] Information has been obtained from the Environmental Consultant (Kaya Grup Çevre ve Madencilik) of Çekerek Municipality.

image showing the location and discharge point (Çekerek River) of the WWTP in question is given in Figure 5-16. It has been stated that there is a protocol with Yozgat Solid Waste Association for the disposal of the dewatered sludge of the WWTP in question.

Figure 5-16. Satellite Image of Çekerek WWTP[34]

Table 5-17. Licensed WWTPs in Yozgat Province belonging to Municipalities

Application No	Environmental ID No	Name of the Facility	Address of the Facility	Subjects of the Permit	Type of the Certificate	Approval Date	Additional Scope Articles
624598	1526368046	Çekerek Municipality Presidency	BAĞLARBAŞI Mahallesi, 13. SOKAK, No: 1 -, ÇEKEREK, YOZGAT, Türkiye	Wastewater Discharge	Permit and License Certificate	15.05.2024	10.2 Urban and/or domestic wastewater treatment plants with a capacity of less than 20,000 m^3/day.
594304	797851632	Yozgat Municipality Presidency	Cemil Çiçek (Musabeyli) Havzası Bişek Köyü, MERKEZ, YOZGAT	Wastewater Discharge	Permit and License Certificate	09.05.2023	10.2 Urban and/or domestic wastewater treatment plants with a capacity of less than 20,000 m^3/day.
593529	797901696	Yozgat Municipality Presidency	Cemil Çiçek (Musabeyli) Havzası Gülyayla Köyü, MERKEZ, YOZGAT	Wastewater Discharge	Permit and License Certificate	09.05.2023	10.2 Urban and/or domestic wastewater treatment plants with a capacity of less than 20,000 m^3/day.
84850	224586344	Yozgat Municipality Presidency	YOZGAT, ŞEYH OSMAN Mahallesi, ADNAN MENDERES BULVAR, No: 10-A, MERKEZ,Türkiye YOZGAT	Wastewater Discharge	Permit and License Certificate	01.04.2021	-
627218	1912011246	Sorgun Biological Wastewater Treatment Plant	MÜKREMİN Mahallesi, ESKİKÖPRÜ CADDE, No: 9 -, SORGUN, YOZGAT, Türkiye	Wastewater Discharge	Temporary Activity Certificate	08.02.2024	10.2 Urban and/or domestic wastewater treatment plants with a capacity of less than 20,000 m^3/day.

5.9.3 Waste

Solid waste collection and transportation service in the city center is provided by Yozgat Municipality. Solid waste is disposed of in the regular landfill belonging to the Yozgat Union of Municipalities, which was put into service in 2007. In the city center, solid waste is collected by municipalities in garbage bins, transported by trucks and sent to the Regular Storage Facility. However, some district municipalities still continue wild storage. There is also a treatment plant for leachate in the regular storage facility. It is also planned to increase the number of solid waste transfer stations. Treatment sludge originating from municipalities is dewatered and sent to solid waste landfill.

Although 100 tons of solid waste is generated per day in the province, these solid wastes are disposed of in the regular landfill located in Salmanfakılı village of the Yozgat Municipalities Union, which was put into service in 2007.

The information on the Yozgat Province Waste Landfill and Çorum Province Waste Landfill is given in Table 5-18. Moreover, a list of licensed waste management facilities has been attached to the Waste Management Plan prepared for the Project (see Appendix-6).

Table 5-18. Yozgat Province Domestic Waste Landfill Information

Features	Details	
Application No	513918	468123
Environmental ID No	227674806	233355438
Name of the Facility	ITC-KA ENERJİ ÜRETİM SAN. VE TİC. A.Ş.- Yozgat Branch	ÇORUM BELEDİYELER ÇEVRE BİRLİĞİ (Çorum Municipalities Environment Union)
Address of the Facility	Salmanfakılı Village No:125/1, Centre / Yozgat	Karapürçek Village Kuşyakası Locality, Centre / Çorum
Province of the Facility	Yozgat	Çorum
Subjects of the License	Sanitary Landfill - Class 2 (Municipal Waste and Non-Hazardous Waste Sanitary Landfill), Biodegradable Waste Processing - Mechanical Separation, Biodegradable Waste Processing - Biomethanization	Landfill - Class 2 (Municipal Waste and Non-Hazardous Waste Landfill), Biodegradable Waste Processing - Compost
Subjects of the Permit	Air Emission	-
Type of the Certificate	Permit and License Certificate	Permit and License Certificate
Approval Date	26.08.2021	02.01.2020
Additional Scope Articles	-	-
Waste Codes	-	-

After the leachate generated in the lots is collected in the balancing pool, it is treated in the leachate treatment facility located in the facility and discharged in accordance with the discharge standards specified in the regulation. There is no recycling of solid waste in the province. Below is the chart (see Figure 5-17) showing the solid waste composition of Yozgat Municipality in 2022.

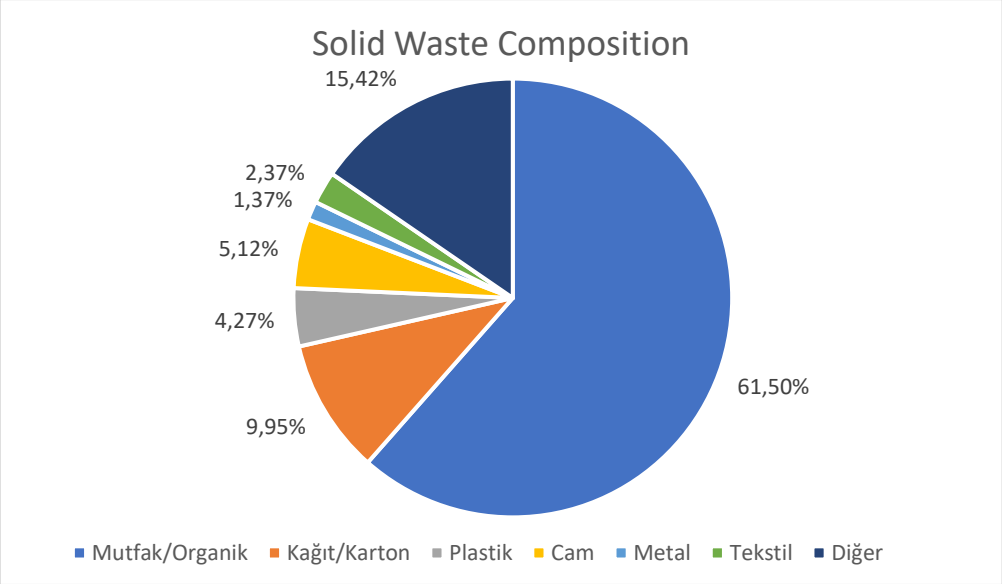

Figure 5-17. Solid Waste Composition in Yozgat Province[13]

There are 6 plastic packaging waste recovery facilities, 2 vegetable waste oil recovery facilities, and 9 non-hazardous waste recovery facilities throughout the Yozgat province.

The total amount of medical waste collected in Aydıncık district in 2022 is 1,944 tons/year and there is one medical waste sterilization facility in Yozgat province.

Yozgat Provincial Special Administration is responsible for the disposal of domestic solid waste in Kösrelik, Mercimekören and Kocabekir villages, and wastes are collected once a week in the region. However, in Körpınar village there are no domestic waste containers, and the domestic waste is not collected by any of governmental institution. According to the mukhtar of Körpınar village, the villagers either collect their domestic wastes and bring them to a close settlement (generally Kocabekir village) which has waste containers, or they burn their domestic wastes in the current situation.

There is no licensed landfill in Aydıncık district of Yozgat or Alaca District of Çorum. Therefore, domestic solid wastes generated by the employees will be sent to licensed Yozgat Regular Storage Facility with licensed vehicles. Since the Project area is closer to the Yozgat Regular Storage Facility than Çorum, it is envisaged that the domestic solid wastes generated by the Project will be sent to Yozgat Regular Waste Storage Facility.

Within the scope of the Project, all kinds of waste generated by the Project activities and personnel will be collected separately in a temporary waste storage area as per the natural and international standards. and waste recycling, transport and disposal for the Project generated wastes will be carried out by means of companies licensed by the MoEUCC. All licensed facilities regarding the waste handling are listed in Annex-2 of the Waste Management Plan prepared for the Project (see Appendix-6).

It is the responsibility of the Contractor to create a temporary storage area, separate collection, transportation, recycling and disposal of the Project waste in accordance with the national and international standards. In this context, the Contractor will make necessary agreements/protocols with the municipalities and licensed companies.

5.10 Biodiversity and Natural Protected Areas

ESIA biodiversity studies within the scope of the Project have been conducted using ESS6 standards based on previously published scientific work, reports on habitats and species, field surveys (February 14th and August 13th, 2024) and expert judgement. Methodologies applied by field experts targeting different animal and plant groups considered priority habitats of the area, species of high conservation concern and also protected areas.

5.10.1 Methodology for Biodiversity Studies

5.10.1.1 Flora, Habitat and Ecosystems

Data on flora and vegetation were acquired via standardized quadrate method (Sutherland, 2006) to estimate population bundance (number), density, frequency and distributions.

Floristic list was given according to the phylogenetic order in the Flora of Türkiye in the form of Pteridophyta, Gymnospermae, and Angiospermae, and families under each group were sorted in accordance with the phylogenetic order in the Flora of Türkiye. Species were given with their auteur names and if any, names in Turkish, English, whether it is endemic or not, danger categories of endemic and rare species, and abundance of each species within the area were given respectively.

Plants collected from the study area were determined using relevant floras, the work Flora of Türkiye and the East Aegean Islands (Davis, 1965-1988) being the first. In order to determine endemic species and endangered species although they are not endemic, Red Book of Türkiye Plants (Ekim et al., 2000) was taken as reference. Since Red Book of Turkish Plants was prepared in accordance with the criteria of IUCN 1994, danger categories were revised in accordance with IUCN 2001.

Endemic, rare species and species under international preservation, as well as significant habitats were determined within the determined species. Areas where endangered species concentrates along the line and sensitive ecosystems were reported including reasons and such areas were referred as "Ecologically Sensitive Areas." Because such areas are highly sensitive to deterioration either due to rare species they contain or to the fact that necessary measures were not taken. Additional information was given on what kind of measures need to be taken in these determined areas, when should the construction be carried out in order to minimize impact, and whether there are species requiring collecting seeds or to make translocation.

Field studies were conducted on February 14 and August 13, 2024, but no studies could be conducted in the pond due to insufficient water to investigate aquatic organisms.

5.10.1.2 Mammals

Although small terrestrial mammals are abundant, they are hardly observed, their prints are hardly seen, and species are determined with difficulty. However, they can be caught easily with traps at a sufficient number (e.g., standard Sherman live animal trap). Species specific to habitat types shall be determined by setting live animal traps at sufficient number, in order to represent habitat types.

Observation method is suitable for medium and large mammals: especially (i) direct observation and (ii) excretion analysis, prints, or identifying other signs.

Priority aim in site studies shall be to find out species diversity in locations to be determined according to habitat types along the line.

5.10.1.3 Birds

Observations were performed using point and line transects method. In addition to determination of bird species by observation during the field studies, the existence of habitats eligible for preferences of birds such as mud flat and rocky places, bird traces (nests-fledglings, feathers, claw prints, vomits and excretions, identifiable bone parts), and feeding signs were utilized in determining bird species.

Previously prepared reports were revised by comparing the determined species with previous studies. If the presence of an endemic or rare species is detected, necessary precautions and information about the species was given in detail.

5.10.1.4 Reptiles

Reptiles are ectothermic like Amphibians. This means they require an external 'boost' to their body temperature to become fully active. Reptiles achieve this effect by positioning themselves in places of increased warmth. This can involve 'basking' on a heat gathering surface in the sunshine (in the open or amongst some vegetation) or under objects (refugia) that absorb heat. Much of this behavior occurs during the morning and late afternoon but potentially at any time of the day depending on season and weather patterns. This presents us with an opportunity to lead to their discovery.

The best survey timing varies with location, weather patterns and species, but generally reptiles are active from March to October. The best time to survey is a mixture of time of year, time of day and weather conditions. The reptiles may appear near hibernation sites if conditions are suitable in March and April. Late August to late September can be useful for seeing juvenile animals. July and early August are generally less useful months for surveying due to the days being hotter (even reptiles can get too hot and seek shade). Time of day: In late June, when the weather is generally warmer, reptiles may be found earlier in the morning and later in the afternoon. Weather conditions: peak air temperature is between 9-20°C. Bright sunshine is favorable on cooler days and hazy or intermittent sunshine is favorable when warmer. Rain or wind is unsuitable. Also, weather sequence is important: a hot spell after several days of cold weather or showery weather after a prolonged dry period are favorable.

Reptile habitat generally has open aspect areas, is well drained and south facing, is mostly sunny, sheltered and relatively undisturbed. Therefore, grasslands, open woodland, forests, sand dunes, disused corners/edges of allotments, road and rail verges/embankments garden walls were searched. However, under refugia such as logs, and large stones were checked. Each sampling location was searched about 30-90 minutes in duration. For each sampling points, identified species were recorded. Also, species' photos were taken when it was possible.

Previously prepared reports were revised by comparing the determined species with previous studies. If the presence of an endemic or rare species is detected, necessary precautions and information about the species was given in detail.

5.10.1.5 Amphibians

Within the scope of the Project, determination of the Amphibian species within the project area and impact area contained three main techniques for surveying.

Visual search of water body and surrounding area

During the daytime, at any water body in project area, the water body edge and surrounding terrestrial habitat were walked and looked for Amphibians in the water – including tadpoles and newt efts. The amphibians can travel several hundred meters away from the water body; therefore, they were searched far away from the water body and under refugia such as logs

and large stones. Amphibians' calling is species-specific. Therefore, species identification can be made from the Amphibian calling. If an Amphibian call is heard during the herpetological survey, the species were also be identified from calling.

Netting in pond

Netting can be useful for detecting: Adult newts, frog and toad tadpoles. A net was used with a rigid frame and a mesh of approximately 2 mm. The net was sweep in a strong agitating motion through vegetation at the water body edge every two meters. The animals were avoided to be touched and they were quickly released back into the water after they are photographed.

Night Survey

Some Amphibians are nocturnal and most active after dark, and advertising calling is more frequent at night. A powerful torch (lights) is an effective way to spot them in open water. A powerful torch in the range of 500,000 to 1 million candlepower was used. The waterbody was searched by torchlight from the banks.

Previously prepared reports were revised by comparing the determined species with previous studies. If the presence of an endemic or rare species is detected, necessary precautions and information about the species was given in detail.

5.10.2 Biodiversity Survey Area (BSA)

A biological diversity survey area describes a designated area where studies and research related to biological diversity are conducted. In order to identify impacts of the Project on biodiversity and to conduct critical habitat assessment, in line with the provisions of the World Bank ESS6, the Biodiversity Study Area (BSA) was determined as 50 meters extending from the border of the project area (see

Figure 5-18[35]).

[35] QGIS Software 3.36.2, https://qgis.org/it/site/

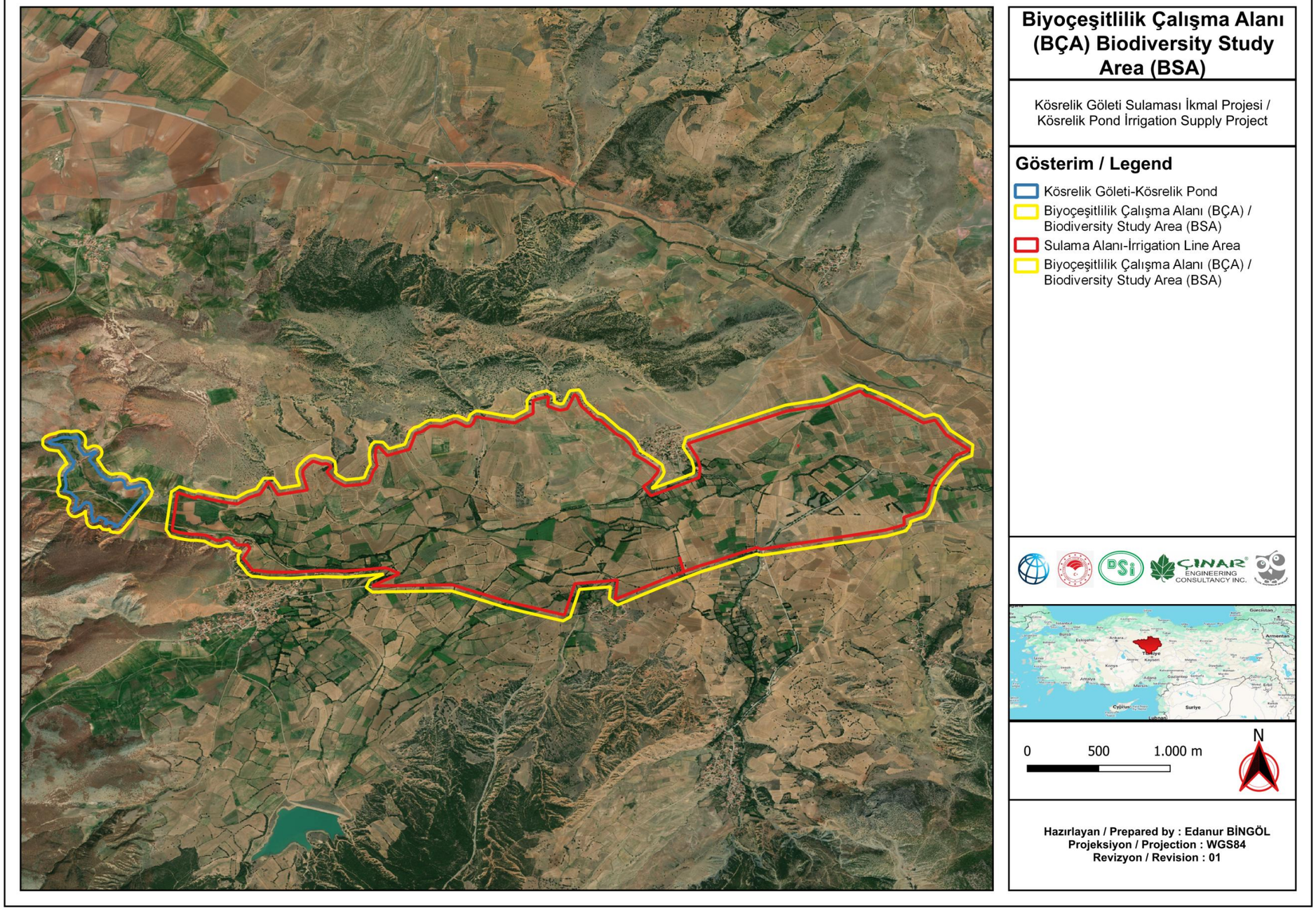

Figure 5-18. Biodiversity Survey Area (BSA)[35]

5.10.3 Protected Areas

The World Bank ESS6 identifies two different types of protected areas: legally protected and internationally and regionally recognized areas of biodiversity value. Legally Protected Areas as defined by ESS6 as *"A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."* while Internationally Recognized Areas as *"Internationally recognized areas of high biodiversity value include World Heritage Natural Sites, Biosphere Reserves, Ramsar Wetlands of International Importance, Key Biodiversity Areas, Important Bird Areas, and Alliance for Zero Extinction Sites, among others."*

In line with this approach, areas that have been designated a status under the Turkish protected area system, as well as areas designated as Key Biodiversity Areas (KBAs), Important Bird and Biodiversity Areas (IBAs) and Important Plant Areas (IPAs) were screened for the purpose of this document.

Legally protected areas constitute an integral part of biodiversity conservation efforts, as well as ecosystem services provided by ecological functions they convey. In Türkiye, Ministry of Agriculture and Forestry is the main official body responsible for development and implementation of national biodiversity conservation policies, action plans, designation of conservation areas, and many other related tasks conducted by its central and local directorates within the Ministry's organizational structure. IUCN Protected Area Management Categories (Dudley et al.,2013) were adopted to restructure the Turkish Protected Area System in 2006 through the Biodiversity and Natural Resource Management Project undertaken by the Ministry's General Directorate of Nature Conservation and National Parks (Thomas, 2006). The IUCN Protected Area Management Categories provide a global framework and is recognized by the Convention on Biological Diversity, with an initial objective of creating a common understanding of protected areas within and between countries. Categorization is done according to the primary management objectives for a protected area, based on the principles listed as the following:

- assignment to a category is a not a commentary on management impactiveness,
- the categories systems is international; national names for protected areas may vary, and
- all categories are important; and gradation of human intervention is implied.

Accordingly, legally protected areas in Türkiye, were re-classified under the 6 protected area management categories defined by the IUCN Guidelines, which identify the main reasons for management as the following:

I Strict protection [Ia) Strict nature reserve and Ib) Wilderness area]
II Ecosystem conservation and protection (i.e., National park)
III Conservation of natural features (i.e., Natural monument)
IV Conservation through active management (i.e., Habitat/species management area)
V Landscape/seascape conservation and recreation (i.e., Protected landscape(seascape)
VI Sustainable use of natural resources (i.e., Managed resource protected area)

Legally protected areas around the Project area and their IUCN protected area categories are given in Table 5-19, and a map showing the locations of the protected areas with respect to the Project route is presented in Figure 5-19. Considering the distances between the project and the legally protected areas in the region, there will be no Project-related impacts

on these areas. No activities related to the Project will be carried out within the boundaries of the protected areas.

Table 5-19. Legally Protected Areas near the Project Route[36, 37, 38, 39]

Protected Area	IUCN Protected Area Category	Distance to the Project Route (km)
Yozgat Çamlığı National Park	Ia, II, VI	49.39
Yozgat Fatih Nature Park	V	47.60
Üçtepeler Nature Park	V	39.43
Oluközü Nature Park	V	70.80
Kadınpınarı Nature Park	V	77.32

[36] Ministry of Agriculture and Forestry, General Directorate of Nature Protection and National Parks, https://www.tarimorman.gov.tr/DKMP/Belgeler/dkmp/resmiistatistikler/korunanalanistatistikleri/2018/haberb%C3%BClteni2018_ver1-1.pdf
[37] National Wetland Inventory Management Information System, https://saybis.tarimorman.gov.tr/
[38] https://www.turkiyesulakalanlari.com
[39] QGIS Software 3.36.2, https://qgis.org/it/site/

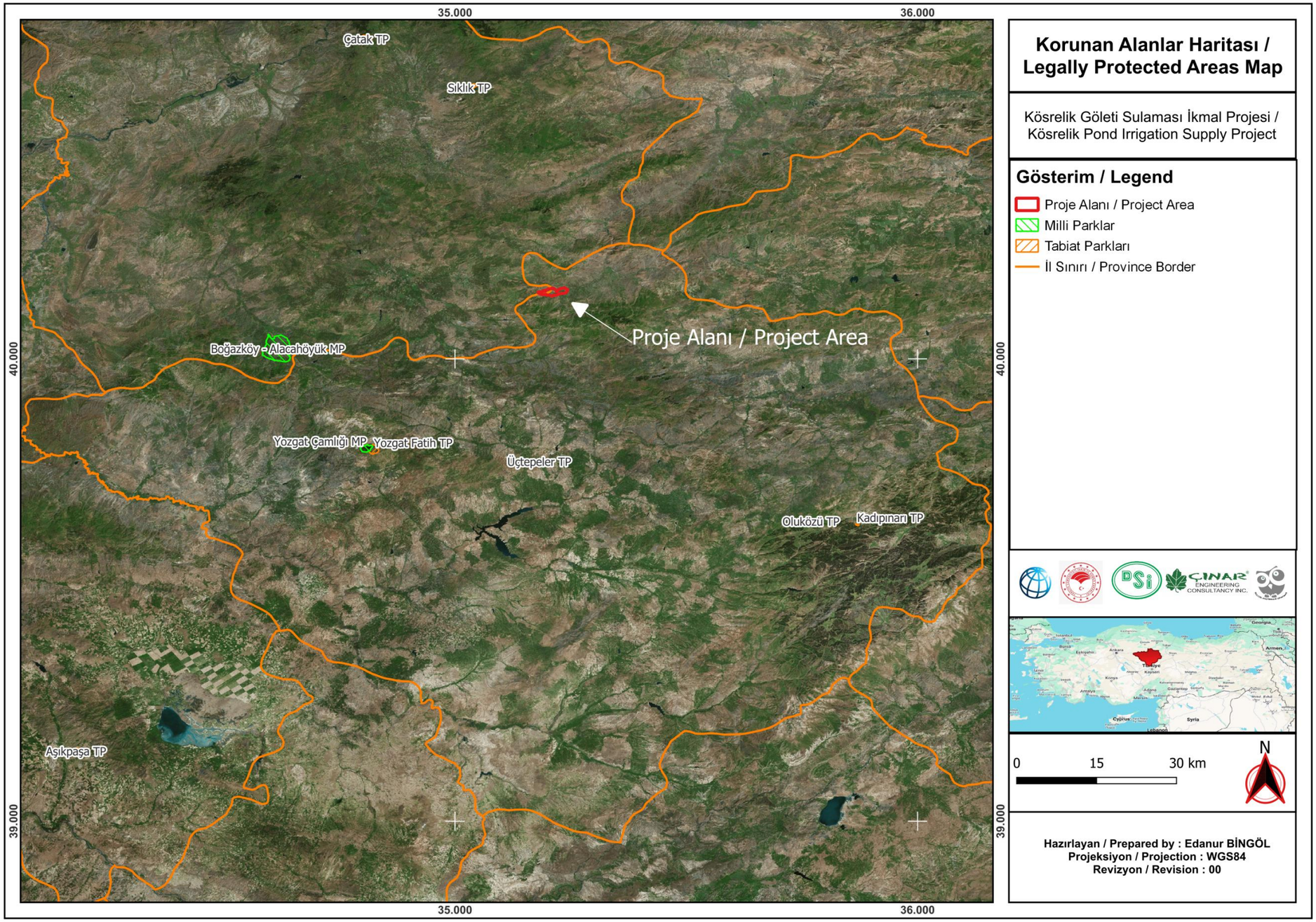

Figure 5-19. Legally Protected Areas[36, 37, 38, 39]

ESS6 defines Internationally Recognized Areas include World Heritage Natural Sites, Biosphere Reserves, Ramsar Wetlands of International Importance, Key Biodiversity Areas, Important Bird Areas, and Alliance for Zero Extinction Site.

In Türkiye, besides the Ministry's official work, there are various non-governmental organizations (NGOs), academic entities, as well as individual researchers and professionals who work in collaboration or independently to better understand Türkiye's natural resources and put forward impactive conservation strategies to ensure survival of habitats and species, some of which constitute unique ecosystems of global conservation value.

Doğa Derneği, published an inventory on Key Biodiversity Areas (KBAs) in Türkiye in 2006 in collaboration with the Ministry of Environment and Forestry, integrating survey results across the country with expert opinions (Eken et al., 2006). The preparation of the inventory was the first time the KBA approach was applied on a national scale, which was based on principles developed by BirdLife International for bird species in their "Important Bird Areas" studies. One of the fundamental functions of the inventory is defined as "providing resources for areas and species that should be worked upon to reach zero extinction".

Internationally recognized areas around the Project area are presented in Figure 5-20[40, 41, 42, 43, 44]. Considering the distances between the project and the internationally recognized areas in the region, there will be no Project-related impacts on these areas.

Based on the information obtained from Turkey National Geographic Information Systems, National Geographic Information Platform (atlas.gov.tr), there are no monumental trees, caves, protected areas, or special environmental protection zones within the scope of the General Directorate for the Protection of Natural Assets in the project area.

There are no internationally recognized areas of high biodiversity value within the project area considering internationally recognized areas of high biodiversity value include World Heritage Natural Sites, Biosphere Reserves, Ramsar Wetlands of International Importance, Key Biodiversity Areas, Important Bird Areas, and Alliance for Zero Extinction Sites, among others.

[40]. Eken G, Bozdoğan M, İsfendiyaroğlu S, Kılıç DT, ve Lise Y. (Ed.) (2006) *Türkiye'nin Önemli Doğa Alanları*. Ankara: Doğa Derneği.
[41] Özhatay, N., Byfield, A., Atay, S., (2005.) Türkiye'nin 122 Önemli Bitki alanları, WWF Türkiye, İstanbul.
[42] Kılıç DT ve Eken G. (2004). *Türkiye'nin Önemli Kuş Alanları 2004 güncellemesi*. Ankara: Doğa Derneği.
[43] Ertan A, Kılıç A, Kasparek M. (1989). *Türkiye'nin Önemli Kuş Alanları*. İstanbul: Doğal Hayatı Koruma Derneği.
[44] Yarar M ve Magnin G. (1997). *Türkiye'nin Önemli Kuş Alanları*. İstanbul: Doğal Hayatı Koruma Derneği.

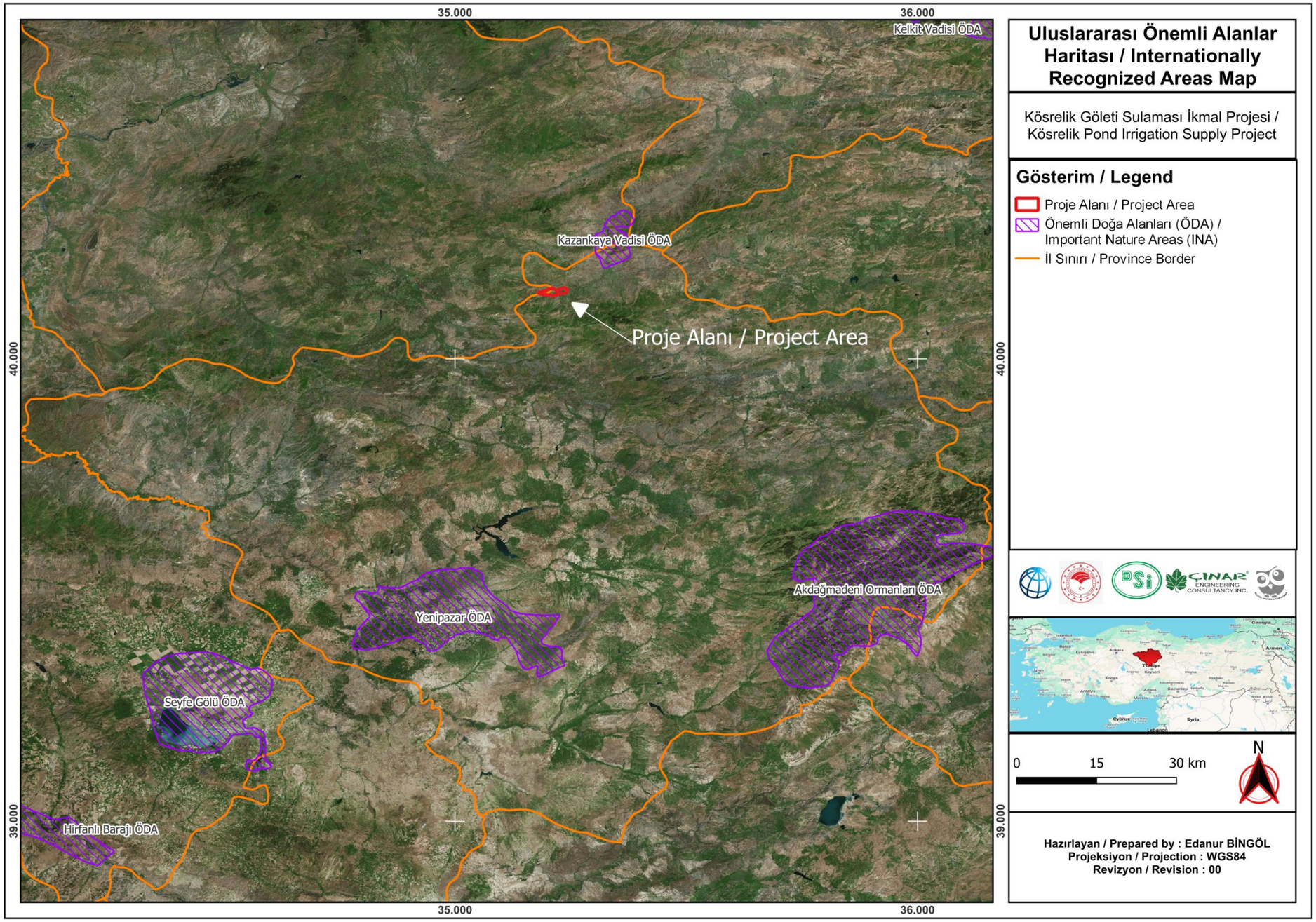

Figure 5-20. Internationally Recognized Area Map[40, 41, 42, 43, 44]

5.10.4 Baseline Conditions

Baseline surveys conducted in the Biodiversity Survey Area as shown in

Figure 5-18, rely on previously conducted studies, literature information on habitats and species, as well as direct observations and Project-specific data collected on site by field experts. Some of the general methodologies for field surveys (February 14th and August 13th, 2024) can be listed as the following:

- In determining sampling/vantage points, locations that represent different habitat types and those that had been identified to be significant to species were considered.
- Some of the flora and fauna species were recorded through direct observations.

The construction activities will be carried out mainly on agricultural lands and near Özdere Stream. It was determined during the field studies that there was insufficient water level in the Özdere stream. This condition does not provide suitable conditions for fish species to sustain their life cycles. Therefore, fish species were not included in the assessment.

Structural changes (excavation, filling, concrete pouring) that will occur may disrupt the sediment structure of the Pond. Therefore, the material that will be formed during the works within the scope of the Project (vegetable soil, excavation material, etc.) will not be thrown into the stream beds. If the recommendations given are followed, the habitat will return to its natural structure after the construction phase, and the Project will not have an impact on the stream.

5.10.4.1 Habitat Classification

The European Nature Information System (EUNIS) puts forward a system for identification and classification of European habitat types. Classification area is quite large including the entire European mainland and seas including islands that are close to the mainland (except for Cyprus, Iceland and Greenland), EU states' archipelagos (Canary Islands, Madeira Islands and Azore Islands) and the European mainland to the west of Ural Mountains that cover Türkiye and the Caucasus. The main objective of the EUNIS habitat classification is to create a European reference set of habitat types including a description of all types and hierarchical classification.

Habitats within the Biodiversity Study Area were evaluated in accordance with the EUNIS classification, which is useful in terms of not only relating the national classifications to international level, but in terms of corresponding EUNIS habitats to habitats listed in Annex I of Habitats Directive for "designation of special areas of conservation" and the European Red List of Habitats (Janssen, 2016) for the critical habitat assessment.

Natural habitat types of the Biodiversity Study Area, characteristic plant species of these habitats, related EUNIS codes, corresponding Habitat Directive Annex I habitats and Natura 2000 codes, as well as the European Red List categories are presented in Table 5-20. In addition to habitats explained in the table, there are also modified and artificial habitats that can be listed as; J1.2: Residential buildings of villages and urban peripheries, J4.2: Road networks, and I1.2: Mixed crops of market gardens and horticulture.

Table 5-20. Habitats of the Biodiversity Study Area[45]

EUNIS Habitat Type	Habitats Directive Annex I	Habitat Characteristics
C2 - Surface running waters	-	Running waters, including springs, streams and temporary water courses.
J1.2: Residential buildings of villages and urban peripheries	-	-
J4.2: Road networks	-	-
I1.2: Mixed crops of market gardens and horticulture	-	-

5.10.4.2 Terrestrial Flora

To identify the flora composition of the Biodiversity Study Area, first sampling points representing different habitat types in the area were determined. For assessment of Project-related impacts, field surveys were conducted in BSA. At each of the sampling locations, habitats were studied in detail, and flora species were identified based on related findings and observations.

The general vegetation characteristics of the Project area consists of agricultural lands, tree species such as poplar, larch, walnut, oak and oleaster, and other fruit trees and bushes belonging to the agricultural landowners.

As a result of the studies carried out in the project area, 36 species and subspecies taxa belonging to 20 families were identified from the area (see Table 5-21). None of the listed species were endemic. 14 species were listed as “LC” (least Concern) and 22 species were listed as “NE” (Not Evaluated) according to the IUCN. None of the listed species were in Bern and CITES annexes.

Table 5-21. Flora Species Identified at the Biodiversity Study Area

Family	Species	Turkish Name	Endemism	IUCN	CITES	BERN
Amaryllidaceae	*Allium aschersonianum*	Mor Soğan	-	NE	-	-
Apiaceae	*Daucus carota*	Yabani Havuç	-	LC	-	-
Apiaceae	*Eryngium campestre*	Kırsenet	-	NE	-	-
Asteraceae	*Cichorium intybus*	Hindiba	-	LC	-	-
Asteraceae	*Xanthium spinosum*	Pıtrak	-	NE	-	-
Asteraceae	*Carduus nutans*	Eşekdikeni	-	NE	-	-
Asteraceae	*Scolymus hispanicus*	Şevketi Bostan	-	NE	-	-
Asteraceae	*Centaurea iberica*	Deligözdikeni	-	NE	-	-
Asteraceae	*Lactuca serriola*	Eşekhelvası	-	LC	-	-
Asteraceae	*Echinops orientalis*	Dağşekeri	-	NE	-	-
Asteraceae	*Taraxacum buttleri*	Karahindiba	-	NE	-	-
Asteraceae	*Helianthus annuus*	Ayçiçeği	-	LC	-	-
Asteraceae	*Cirsium arvense*	Köygöçüren	-	NE	-	-
Asteraceae	*Scolymus hispanicus*	Şevketi Bostan	-	NE	-	-
Boraginaceae	*Heliotropium europaeum*	Akrep Otu	-	NE	-	-

[45] European Nature Information System, Habitats, https://eunis.eea.europa.eu/habitats-code-browser.jsp?expand=290,414,1808,312,5394,415,538,2407#level_2407

Boraginaceae	*Echium italicum*	Kurtkuyruğu	-	NE	-	-
Caprifoliaceae	*Dipsacus laciniatus*	Fesçitarağı	-	NE	-	-
Convolvulaceae	*Convolvulus arvensis*	Tarla Sarmaşığı	-	NE	-	-
Elaeagnaceae	*Elaeagnus angustifolia*	İğde	-	LC	-	-
Fagaceae	*Quercus pubescens*	Tüylü Meşe	-	LC	-	-
Juglandaceae	*Juglans regia*	Ceviz	-	LC	-	-
Lythraceae	*Lythrum salicaria*	Hevhulma	-	LC	-	-
Malvaceae	*Hibiscus trionum*	Kerkede	-	NE	-	-
Malvaceae	*Althaea cannabina*	Gülhannaz	-	NE	-	-
Pinaceae	*Pinus nigra*	Karaçam	-	LC	-	-
Poaceae	*Bromus tectorum*	Kır Bromu	-	NE	-	-
Poaceae	*Avena fatua*	Deli Yulaf	-	LC	-	-
Polygonaceae	*Rumex crispus*	Labada	-	LC	-	-
Ranunculaceae	*Consolida orientalis*	Morçiçek	-	NE	-	-
Resedaceae	*Reseda luteola*	Eşekçitlimi	-	NE	-	-
Rosaceae	*Rosa canina*	Kuşburnu	-	LC	-	-
Rosaceae	*Rubus sanctus*	Böğürtlen	-	NE	-	-
Rosaceae	*Prunus spinosa*	Çakal Eriği	-	LC	-	-
Salicaceae	*Populus alba*	Akkavak	-	LC	-	-
Scrophulariaceae	*Verbascum cheiranthifolium*	Bozkulak	-	NE	-	-
Typhaceae	*Typha latifolia*	Cil	-	NE	-	-

*** LC = Least Concern NE = Not Evaluated**

Sources:

1. Davis, P.H. (ed.), Flora of Türkiye and the East Aegean Islands. Vol. 1-9, 1965-1985 (Edinburgh).
2. Davis, P.H., Mill, R.R, Tan, K.(eds), Flora of Türkiye and The East Aegean Islands, Vol. 10, at the Universty Press, 1988, (Edinburgh).
3. Güner, A., Özhatay, N., Ekim, T., Başer, K.H.C (eds.), Flora of Türkiye and The East Aegean Islands, Vol. 11, at the University Press, 2000, (Edinburgh).
4. Davis, P.H., ve Cullen, J., The identification of flowering plant families, 1979 (Londra).
5. Güner, A., Aslan, S., Ekim, T., Vural, M., Babaç, M.T., (edlr.), (2012). Türkiye Bitkileri Listesi (Damarlı Bitkiler).
6. Nezahat Gökyiğit, Botanik Bahçesi ve Flora Araştırmaları Derneği Yayını. İstanbul.
7. Güner, A., Özhatay, N., Ekim, T., Başer, K.H.C (eds.), Flora of Türkiye and The East Aegean Islands, Vol. 11, at the Universty Press, 2000, (Edinburgh).
8. Ekim, T., Koyuncu,M., Vural, M., Duman, H., Aytaç, Z., ADIGÜZEL, N. (2000) Türkiye Bitkileri Kırmızı Kitabı (Eğrelti ve Tohumlu Bitkiler), Van Yüzüncü Yıl Üniversitesi ve Tabiatı Koruma Derneği, Barışcan Ofset, Ankara.
9. Ketenoğlu, O., Obalı, O., Güney, K., Geven, F.,2003. Ekonomik Bitkiler.
10. Akkemik,Ü. (Ed). 2018. Türkiye'nin Doğal-Egzotik Ağaç ve Çalıları. Orman Genel Müdürlüğü Yayınları, Ankara. 684 s.
11. Yozgat İli'nin Karasal ve İç Su Ekosistemleri Biyolojik Çeşitlilik Envanter ve İzleme Projesi, T.C. Tarım ve Orman Bakanlığı

5.10.4.3 Amphibian and Reptile Species

To identify the herpetofauna composition of the Biodiversity Study Area, the first sampling points representing different habitat types in the area were determined. For assessment of Project-related impacts, field surveys were conducted in BSA. At each of the sampling locations, habitats were studied in detail, and herpetofauna species were identified based on related findings and observations.

As a result of the studies carried out in the project area, 12 species belonging to 8 families were identified from the area (see Table 5-22). None of the listed species were endemic. 1 species was listed as "VU" (Vulnerable), 10 species were listed as "LC" (least Concern) and 1 species was listed as "NE" (Not Evaluated) according to the IUCN.

Table 5-22. Herpetofauna Species Identified at the Biodiversity Study Area

Family	Species	Turkish Name	Common Name	Endemism	IUCN	CITES	BERN
Agamidae	*Stellagama stellio*	Dikenli Keler	Roughtail Rock Agama	-	LC	-	App-II
Bufonidae	*Bufo bufo*	Siğilli Kurbağa	Common Toad	-	LC	-	App-III
Colubridae	*Dolichophis schmidti*	Kırmızı Yılan	Schmidt's Whip Snake	-	LC	-	App-III
Colubridae	*Eirenis modestus*	Uysal Yılan	Anatolian Dwarf Racer	-	LC	-	App-III
Lacertidae	*Parvilacerta parva*	Cüce Kertenkele	Dwarf Lizard	-	LC	-	App-II
Lacertidae	*Ophisops elegans*	Tarla Kertenkelesi, Yılan Gözlü Kertenkele	Snake-Eyed Lizard	-	NE	-	App-II
Lacertidae	*Lacerta viridis*	Yeşil Kertenkele, Zümrüt Kertenkele	Green Lizard	-	LC	-	App-II
Pelobatidae	*Pelobates syriacus*	Toprak Kurbağası	Eastern Spadefoot, Syrian Spadefoot	-	LC	-	App-II
Ranidae	*Pelophylax ridibundus*	Ova Kurbağası, Bataklık Kurbağası	Euroasian Marsh Frog, Marsh Frog	-	LC	-	App-III
Ranidae	*Rana macrocnemis*	Uludağ Kurbağası	Long-Legged Wood Frog	-	LC	-	App-III
Scincidae	*Heremites vittatus*	Şeritli Kertenkele	Bridled Mabuya	-	LC	-	App-III
Testudinidae	*Testudo graeca*	Tosbağa	Mediterranean Spur-Thighed Tortoise	-	VU	II	App-II

IUCN Red List: NE= Not Evaluated, LC=Least Concern, VU= Vulnerable

CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)
Appendix-I: species, which are under the threat of extinction. Trade in the specimens of these species is not allowed except in extraordinary circumstances
Appendix-II: species, which are not threatened with extinction but trade in specimens is restricted to prevent utilization incompatible with their survival
Appendix-III: species for which other parties of CITES is applied for assistance in controlling trade and which are conserved at least in one country

BERN: Bern Convention
Appendix II: List of strictly protected fauna species
Appendix III: List of protected fauna species

1. **Sources:**
2. Baran İ, Atatür, M.K., 1998. Türkiye Herpetofaunası, ISBN 975-7347-37-X, Çevre Bakanlığı, Ankara, Türkiye.
3. Baran, İ, 2005. Türkiye Ampfibi ve Sürüngenleri, ISBN 975-403-356-0, Tübitak Popüler Bilim Kitapları 207 Başvuru Kitaplığı 21, Ankara, Türkiye.
4. Baran, İ., Ilgaz, Ç., Avcı, A., Kumlutaş, Y. ve Olgun, K. (2012). Türkiye amfibi ve sürüngenleri. Tübitak Popüler Bilim Kitapları. Kavaklıdere-Ankara.
5. Başoğlu M, Özeti N., Yılmaz, İ. 1994. Türkiye Amfibileri Genişletilmiş 2. Baskı 212s. Ege Üniversitesi Fen Fakültesi Kitaplar Serisi,no: 151, İzmir, Türkiye.
6. Başoğlu, M., Özeti, N., (1973). Türkiye Amfibileri. İzmir, Türkiye: Ege Üniversitesi Fen Fakültesi Kitaplar Serisi No. 151.
7. Baycan, B., Tosunoğlu, M., 2017. The Catalog of Amphibia and Reptilia Specimens in the Çanakkale Onsekiz Mart University Zoology Museum (COMU-ZM). Turkish Journal of Bioscience and Collections.
8. Bodenheimer, F. S. (1944). Introduction into the knowledge of the Amphibia i and Reptilia of Türkiye. - Istanbul Üniv. Fen Fak. Mecm., Ser. B, 9: 1-78.
9. Budak A, Göçmen B. 2008. Herpetoloji (2. baskı), 230 s., ISBN 975-483-658-2, Ege Üniversitesi Yayınları, Fen Fakültesi Yayın No. 194, İzmir, Türkiye.
10. Budak, A., & Göçmen, B. (2014). Herpetoloji. Ege Üniversitesi. (2. baskı), ISBN 975-483-658-2, Ege Üniversitesi Yayınları, Fen Fakültesi Yayın No. 194, İzmir, Türkiye.
11. Bülbül, U. & Kutrup, B. (2007). Comparison of Skeletal Muscle Protein Bands among Five Populations of Bufo viridis in Türkiye by SDS-PAGE. Turk J Zool 31.
12. Clark, R. J. & Clark, E. D. (1973). Report On a Collection Of Amphibians And Reptiles From Türkiye. Occasional Papers Of California Academy Of Sciences, San Francisco.
13. Demirsoy, A. 2003, Amfibiler, Meteksan A.Ş., Ankara - ISBN: 975-7746-23-1
14. Eiselt, J. (1966). Ergebnisse zoologischer Samrnelreisen in der Turkei: Amphibia caudata. Ann. Naturhistor. Mus. Wien.
15. Flindt, R. &Hemmer, H. (1970). Kreuzungsversuche Mit Bufo calamita, Bufo viridis viridis und Bufo viridis arabicus (Amphibia, Bufonidae). Salamandra, 6 (3/4): 94-98.
16. http://amphibiaweb.org
17. http://www.turkherptil.org
18. https://www.iucnredlist.org
19. Kaya, U. (2001). Morphological investigation of Turkish Tree Frogs, Hyla arborea and Hyla savignyi (Anura, Hylidae). Israel J. Zoology, 47123-134.
20. Mulder, J., 1995. Herpetological observations in Türkiye (1987-1995) – DEINSEA 2: 51-66.
21. Özeti, N., Yılmaz, İ., 1996. Türkiye Amfibileri. İzmir, Türkiye: Ege Üniversitesi Fen Fakültesi Kitaplar Serisi No. 151; Özcan, S., Üzüm, N.,

2014. The Herpetofauna of Madran Mountain (Aydın, Türkiye). Turk J Zool (2014) 38: 108-113.
22. Riehl, C. J., Lell, J. T. &Maxson, L. R. (1995). Relationships among Palearctic Hyla: Insights from Immunology. Biochemical Systematics and Ecology, 23 (3): 245-249.
23. Schmidtler, J. F. (1994). Eine Übersicht neuerer untersuchungen und beobachtungen an der vorderasiatischen molchgattung neurergus cope, 1862. Abhandlungen und berichte für naturkunde, 17, 193-198.
24. Teynie, A. (1991). Observationhs Herpetologiques en Turquie 2eme Partie. Bull. Soc. Herp. Fr. 21-30.
25. Tosunoğlu, M. (1999). Türkiye Bufo viridis (Anura: Morfolojik, Osteolojik Ve Serolojik Araştırmalar. Tr. J. of Zoology, 23 Ek Say1 3. 849-871.
26. Veith M, Schmidtler JF, Kosuch J, Baran, I Seitz A. 2003. Palaeoclimatic changes explain Anatolian mountain frog evolution: a test for alternating vicarianca and dispersal events, MolecularEcology, 1:2 185-199.
27. Venzmer, G.(1922). Neues Verzeichnis der Amphibien und Reptilien von Kleinasien. Zool. Jahrb. Syst. 46: 43-60.
28. Ergül, T. (2011). "Yeşil kurbağa (Hyla savignyi Audouin, 1829)'nın farklı popülasyonlarında bazı büyüme parametrelerinin incelenmesi". (Master's thesis, Rize Üniversitesi/Fen Bilimleri Enstitüsü/Biyoloji Anabilim Dalı).
29. Yozgat İli'nin Karasal ve İç Su Ekosistemleri Biyolojik Çeşitlilik Envanter ve İzleme Projesi, T.C. Tarım ve Orman Bakanlığı
30. Özeti, N. and Yilmaz, I. 1994. Türkiye amphibileri. Ege Üniversitesi Fen Fakültesi Kitaplar Serisi: 221.
31. Baran, I., Ilgaz, C., Kumlutaş, Y., Olgun, K., Avci, A and Iret, F. 2007. On new populations of Rana holtzi and Rana macrocnemis (Ranidae: Anura). Turkish Journal of Zoology 31: 241-247.
32. Çevik, I.E., Arikan, H., Kaya, U. and Atatür, M.K. 2006. Comparative morphological and serological studies of three Anatolian Mountain frogs, Rana macrocnemis , R. camerani and R. holtzi (Anura, Ranidae). Amphibia-Reptilia 27: 63-71.
33. http://www.gbif.org/species/2426798
34. van Riemsdijk I, Arntzen JW, Bogaerts S, Franzen M, Litvinchuk SN, Kurtulus O, Wielstra B 2017 The Near East as a cradle of biodiversity: a phylogeography of banded newts (genus Ommatotriton) reveals extensive inter- and intraspecific genetic differentiation.

5.10.4.4 Bird Species

To identify the avifauna composition of the Biodiversity Study Area, first sampling points representing different habitat types in the area were determined. For assessment of Project-related impacts, field surveys were conducted in BSA. At each of the sampling locations, habitats were studied in detail, and bird species were identified based on related findings and observations.

The construction work will be performed on mostly agricultural lands and near Özdere stream that have limited flow rate, and it has been evaluated that those are not suitable habitats for waterbird species. In order for water birds to be actively present in a region, a large wetland (containing elements such as reeds, aquatic plants, nutritional source, etc.) is needed. The project area does not meet these conditions and there are no water bird species in the project area or its immediate surroundings.

As a result of the studies carried out in the project area, 23 species belonging to 14 families were identified from the area (see Table 5-23). None of the listed species were endemic. 20 species were listed as “LC” (least Concern), 2 species was listed as “NT” (Near Threatened) (*Gypaetus barbatus* - Bearded Vulture and *Falco vespertinus* – Red-Footed Falcon) and 1 species was listed as “VU” (Vulnerable) (*Streptopelia turtur*-Turtle dove) according to the IUCN.

Table 5-23. Bird Species Identified at the Biodiversity Study Area

Family	Species	Turkish Name	Common Name	Endemism	IUCN	CITES	BERN	MAK K
Accipitridae	*Gypaetus barbatus*	Sakallı Akbaba	Bearded Vulture	-	NT	App-II	App-III	-
Accipitridae	*Buteo buteo*	Şahin	Eurasian Buzzard	-	LC	App-II	App-III	-
Alaudidae	*Galerida cristata*	Tepeli Toygar	Crested Lark	-	LC	-	App-III	App-I
Alaudidae	*Lullula arborea*	Orman Toygarı	Woodlark	-	LC	-	App-III	App-I
Columbidae	*Streptopelia decaocto*	Kumru	Eurasian Collared-Dove	-	LC	-	App-III	App-I
Columbidae	*Columba livia*	Kaya Güvercini	Rock Dove	-	LC	-	App-III	App-II
Columbidae	*Streptopelia turtur*	Üveyik	European Turtle-Dove	-	VU	-	App-III	App-II
Coraciidae	*Coracias garrulus*	Gökkuzgun	European Roller	-	LC	-	App-II	-
Corvidae	*Pica pica*	Saksağan	Eurasian Magpie	-	LC	-	-	App-II
Corvidae	*Garrulus glandarius*	Alakarga	Eurasian Jay	-	LC	-	-	App-II

Corvidae	*Corvus monedula*	Küçük Karga	Eurasian Jackdaw	-	LC	-	-	App-II
Corvidae	*Corvus corax*	Kuzgun	Common Raven	-	LC	-	App-III	App-I
Emberizidae	*Emberiza calandra*	Tarla Çintesi	Corn Bunting	-	LC	-	App-III	App-I
Falconidae	*Falco tinnunculus*	Kerkenez	Common Kestrel	-	LC	App-II	App-II	-
Falconidae	*Falco vespertinus*	Ala Doğan	Red-Footed Falcon	-	NT	App-II	App-II	-
Fringillidae	*Carduelis carduelis*	Saka	European Goldfinch	-	LC	-	App-II	-
Muscicapidae	*Luscinia megarhynchos*	Bülbül	Common Nightingale	-	LC	-	App-II	-
Paridae	*Parus major*	Büyük Baştankara	Great Tit	-	LC	-	App-II	-
Passeridae	*Passer domesticus*	Serçe	House Sparrow	-	LC	-	-	App-II
Passeridae	*Passer montanus*	Ağaç Serçesi	Eurasian Tree Sparrow	-	LC	-	App-III	App-I
Prunellidae	*Prunella modularis*	Dağbülbülü	Dunnock	-	LC	-	App-II	-
Sturnidae	*Sturnus vulgaris*	Sığırcık	Common Starling	-	LC	-	-	App-I
Turdidae	*Turdus philomelos*	Öter Ardıç	Song Thrush	-	LC	-	App-III	App-II

IUCN Red List: DD= Data Deficit, NE= Not Evaluated, LC=Least Concern, VU= Vulnerable, EN=Endangered, CR=Critically Endangered

CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)
Appendix-I: species, which are under the threat of extinction. Trade in the specimens of these species is not allowed except in extraordinary circumstances
Appendix-II: species, which are not threatened with extinction but trade in specimens is restricted to prevent utilization incompatible with their survival
Appendix-III: species for which other parties of CITES is applied for assistance in controlling trade and which are conserved at least in one country

BERN: Bern Convention
Appendix II: List of strictly protected fauna species
Appendix III: List of protected fauna species

MAKK 2023-2024
Appendix I: Animals under protection
Appendix II: Animals that are allowed to be hunted for certain periods of time

Sources:
1. http://ebird.org/ebird/Türkiye/myebird
2. http://www.trakus.org
3. https://www.iucnredlist.org
4. Yozgat İli'nin Karasal ve İç Su Ekosistemleri Biyolojik Çeşitlilik Envanter ve İzleme Projesi, T.C. Tarım ve Orman Bakanlığı
5. Türkiye'nin Anonim Kuşları, https://www.trakus.org/kods_bird/uye/?fsx=@

5.10.4.5 Mammals

To identify the mammal composition of the Biodiversity Study Area, the first sampling points representing different habitat types in the area were determined. For assessment of Project-related impacts, field surveys were conducted in BSA. At each of the sampling locations, habitats were studied in detail, and mammal species were identified based on related findings and observations.

As a result of the studies carried out in the project area, 23 species belonging to 12 families were identified from the area (see Table 5-24). None of the listed species were endemic. 1 species (Anatolian Souslik - *Spermophilus xanthoprymnus*) was listed as "NT" (Near Threatened), 21 species were listed as "LC" (least Concern) and 1 species was listed as "DD" (Data Deficient) according to the IUCN.

Table 5-24. Mammal Species Identified at the Biodiversity Study Area

Family	Species	Turkish Name	Common Name	Endemism	IUCN	CITES	BERN	MAKK
Canidae	*Canis lupus*	Kurt	Grey Wolf	-	LC	App-I/II	App-II	-
Canidae	*Canis aureus*	Çakal	Golden Jackal	-	LC	App-III	-	App-II
Canidae	*Vulpes vulpes*	Kızıl Tilki	Red Fox	-	LC	-	-	App-II

Cricetidae	*Microtus levis*	Tarlafaresi	East European Vole	-	LC	-	-	-
Cricetidae	*Microtus socialis*	Küçük Tarlafaresi	Social Vole	-	LC	-	-	-
Erinaceidae	*Erinaceus concolor*	Kirpi	Southern White-Breasted Hedgehog	-	LC	-	-	-
Leporidae	*Lepus europaeus*	Yabani Tavşan	European Hare	-	LC	-	App-III	App-II
Muridae	*Apodemus mystacinus*	Kaya Faresi	Broad-Toothed Field Mouse	-	LC	-	-	-
Muridae	*Mus musculus*	Ev Faresi	House Mouse	-	LC	-	-	-
Muridae	*Apodemus sylvaticus*	Dağ Faresi	Wood Mouse	-	LC	-	-	-
Muridae	*Rattus rattus*	Sıçan	House Rat	-	LC	-	-	-
Mustelidae	*Mustela nivalis*	Gelincik	Least Weasel	-	LC	-	App-III	App-I
Rhinolophidae	*Rhinolophus ferrumequinum*	Büyük Nalburunlu Yarasa	Greater Horseshoe Bat	-	LC	-	App-II	-
Rhinolophidae	*Rhinolophus hipposideros*	Küçük Nalburunlu Yarasa	Lesser Horseshoe Bat	-	LC	-	App-II	-
Sciuridae	*Sciurus anomalus*	Sincap	Caucasian Squirrel	-	LC	-	App-II	-
Sciuridae	*Spermophilus xanthoprymnus*	Anadolu Yersincabı	Anatolian Souslik	-	NT	-	-	-
Soricidae	*Crocidura suaveolens*	Bahçe Sivri Faresi	Lesser White-Toothed Shrew	-	LC	-	App-III	-
Soricidae	*Crocidura leucodon*	Kır Sivri Faresi	Bicolored Shrew	-	LC	-	App-III	-
Spalacidae	*Nannospalax xanthodon*	Anadolu Körfaresi	Nehring's Blind Mole Rat	-	DD	-	-	-
Suidae	*Sus scrofa*	Yabandomuzu	Wild Boar	-	LC	-	-	App-II
Vespertilionidae	*Myotis myotis*	Büyük Fare Kulaklı Yarasa	Greater Mouse-Eared Bat	-	LC	-	App-II	-
Vespertilionidae	*Myotis blythii*	Küçük FarAppulaklı Yarasa	Lesser Mouse-Eared Myotis	-	LC	-	App-II	-
Vespertilionidae	*Pipistrellus pipistrellus*	Bayağı Cüce Yarasa	Common Pipistrelle	-	LC	-	App-III	-

IUCN Red List: DD= Data Deficit, NE= Not Evaluated, LC=Least Concern, VU= Vulnerable, EN=Endangered, CR=Critically Endangered

CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)
Appendix-I: species, which are under the threat of extinction. Trade in the specimens of these species is not allowed except in extraordinary circumstances
Appendix-II: species, which are not threatened with extinction but trade in specimens is restricted to prevent utilization incompatible with their survival
Appendix-III: species for which other parties of CITES is applied for assistance in controlling trade and which are conserved at least in one country

BERN: Bern Convention
Appendix II: List of strictly protected fauna species
Appendix III: List of protected fauna species

MAKK 2023-2024
Appendix I: Animals under protection
Appendix II: Animals that are allowed to be hunted for certain periods of time

Sources:

1. Demirsoy, A., 1992. Yaşamın Temel Kuralları, Omurgalılar / Amniyota (Sürüngenler, Kuşlar ve Memeliler), Cilt-III / Kısım-II., Meteksan A.Ş. Ankara, 1-942.
2. Demirsoy A., 1997. Türkiye Omurgalıları MEMELİLER, Meteksan Ankara, 1-292.
3. Kuru, M., 1999. Omurgalı Hayvanlar. Palme Yayıncılık, Ankara.
4. Kuru, M., 1999. Omurgalı Hayvanlar, Palme Yayınları Fen ve Mühendislik Serisi:145, Ankara.
5. Yiğit, N., Çolak, E., Sözen, M., Karataş, A.,2006. Rodents of Türkiye (Türkiye Kemiricileri). Meteksan, Ankara, 1-154.
6. http://www.tramem.org
7. Kıvanç, E., 1988. Türkiye Spalax'larının Coğrafik Varyasyonları. A.Ü. Fen Fakültesi Biyoloji Bölümü.
8. Kryštufek, B., Vohralík, B., 2009. Mammals of the Türkiye and Cyprus.
9. Coşkun Y. , Kaya A. Additional records of Suncus etruscus (Savi, 1822) (Mammalia: Soricidae) from Southeastern Anatolia, Türkiye. Eur J Biol. 2013; 72(2): 31-35.
10. Yozgat İli'nin Karasal ve İç Su Ekosistemleri Biyolojik Çeşitlilik Envanter ve İzleme Projesi, T.C. Tarım ve Orman Bakanlığı

5.10.5 Invasive Alien Species

The Convention on Biological Diversity (CBD) defines invasive alien species (IAS) as "species whose introduction and/pr spread outside their natural past or present distribution threatens biological diversity". IAS occurs in all taxonomic group of organisms; including animals, plants, fungi and microorganisms, and can affect all types of ecosystems. Invasion by alien species is reported to have caused significant degradation with negative impacts on biological diversity and people's livelihoods according to IUCN, which requires that all projects that may provide a key pathway for invasive species are screened for their potential to accidentally introduce invasive alien species. In line with provisions of ESS6, projects that potentially cause introduction of alien species are subject to a risk assessment. Once established, eradication of IAS requires more effort and resource allocation, prevention is the first step in management.

The Global Invasive Species Programme (GISP) is an international partnership working to address the global threat of IAS, with the main objective of conserving biodiversity and sustain livelihoods by minimizing the spread and impact of invasive alien species with the implementation of Article 8(h) of the CBD. Furthermore, managed by the IUCN's Species Survival Commission, there is an Invasive Species Database (GISD), which currently works on establishing a Global Register of Introduced and Invasive Species (GRIIS) to develop country-wise validated, verified and annotated inventories of introduced and invasive species.

Türkiye has a wide marine IAS dataset, while studies on terrestrial ones have been rather limited. With funding from the Global Environment Fund (GEF), a GEF VI project addressing invasive species threats at key marine biodiversity areas is being implemented by the General Directorate of Nature Conservation and National Parks (GEF, 2020). The project started in 2018, was planned to be completed in four years. The objective of the project is to ensure resilience of marine and coastal ecosystems through strengthened capacities and investment in prevention, detection, control and management of IAS. In line with the most recent European Union legislation (1143/2014) on IAS, which requires a mandatory response by all member states to the threats that invasive species pose to biodiversity and ecosystem services, a similar project will be undertaken also for inland water and terrestrial ecosystems.

Studies that have already been conducted reveal an estimated 1.5% of plant species in Türkiye being exotics (Arslan et al. 2015), although a comprehensive list of alien plants is still lacking. Türkiye is a member of EPPO, an intergovernmental organization responsible for cooperation in plant health within the Euro-Mediterranean region, which aims to protect plants by developing international strategies against the introduction and spread of pests and by promoting safe and impactive pest control methods through A1 and A2 lists of pests recommended for regulation. Arslan et. al. (2015) also report that species that have been recorded in the EPPO list of invasive alien plants that are present in Türkiye are; *Acroptilon repens, Ailanthus altissima, Ambrosia artemisiifolia (A. elatior), Carpobrotus edulis, Cortaderia selloana, Cyperus esculentus, Paspalum distichum (P. paspalodes), Oxalis pes-caprae* and *Sicyos angulatus*, while *Azolla filiculoides* and *Rhododendron ponticum* are listed in the EPPO Observation List of Invasive alien plants and *Miscanthus sinensis*, listed in the EPPO Alert List, are also recorded in the Turkish flora (Arslan et al., 2015).

Project biodiversity studies led by field experts did not yield any data on presence of IAS. However, given the datasets in Türkiye are still limited, necessary measures will be taken as per ESS6. International guidelines and best practices will be followed to avoid intentional or

accidental introduction of alien or non-native species, and if introduced necessary strategies and procedures will be developed to eradicate IAS.

An “Invasive Alien Species Procedure” will be prepared by the Contractor before the construction activities for control and management of IAS.

5.10.6 Critical Habitat Assessment

According to the baseline findings only the tortoise (*Testudo graeca* IUCN:VU) is a potential trigger species. Due to the Project, it will not be in threat. Therefore, due to slow movement of the species, the species should be re-located during construction phase.

The Project area primarily consists of agricultural lands; therefore, the European Turtle-Dove (*Streptopelia turtur*, IUCN:VU) is not considered a trigger species. Also, *Gypaetus barbatus, Falco vespertinus, Spermophilus xanthoprymnus* are not present as trigger species in the project area since their habitats include rocky cliffs, tree-covered plains, and thorny shrublands.The surroundings of the Project area consist of cultivated lands planted with crops harvested annually or regularly. These include products such as onions, corn, and potatoes. The faunal and floral quality and diversity depend on the intensity of agricultural use and the natural vegetation boundaries between fields. The Kösrelik Pond also consists of agricultural areas.

When the previous studies conducted in the area were examined, no endemic species that may be present in and around the project area were found.

The flora-fauna species identified within the scope of the project are generally widely distributed in our country and are not expected to be endangered in the near future. As a result, it is foreseen that the flora-fauna species in the area will not be negatively affected by the Project.

World Bank ESS6 defines, natural habitats as areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area’s primary ecological functions and species composition.

Critical habitat is defined by ESS6 as areas with high biodiversity importance or value, including:

(a) Habitat of significant importance to Critically Endangered or Endangered species, as listed in the IUCN Red List of threatened species or equivalent national approaches;

(b) Habitat of significant importance to endemic or restricted-range species;

(c) Habitat supporting globally or nationally significant concentrations of migratory or congregatory species;

(d) Highly threatened or unique ecosystems; and

(e) Ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (a) to (d).

Since the part of the Özdere Stream near which the Project activities will be undertaken do not have high biodiversity importance or value, and there are no legally protected and internationally recognized areas of high biodiversity value within the close proximity of the Project area, the Project areas are not identified as “critical habitat”.

The Project area is classified as a “modified habitat” based on the following considerations: (i) agricultural activities have significantly altered the area’s primary ecological functions and species composition, (ii) the Project area includes land managed for agricultural purposes, and (iii) the area was not converted in anticipation of the Project, as agricultural activities have been ongoing in the region for a long time. Additionally, the habitat structure along Kösrelik Pond and the Project area is similar, with no observed differences in species composition. It has been determined that the surrounding habitat structure remains intact, and it is expected that the habitat will naturally recover after construction, as no impacts on the habitat are anticipated. In this context, the Project area comprises both modified and natural habitats.

6 SOCIAL BASELINE OF THE PROJECT

6.1 Population and Demography

The population figures of the villages Külekçi, Mercimekören, Kocabekir and Körpınar are given via Table 6-1, Table 6-2, Table 6-3, and Table 6-4, respectively. While Külekçi, Mercimekören, and Kocabekir villages are affiliated to Aydıncık district of Yozgat Province, Körpınar is located within Alaca district of Çorum Province. According to these tables total population of the villages are 471, 46, 78, and 16, respectively. Population distribution of the villages by gender is nearly equal to each other between male and female individuals. Local residents, villagers out of the villages, and seasonal agricultural workers are determined as Project Affected Parties (PAPs). Elderlies, people with handicapped, seasonal workers, minorities and non-Turkish speakers among these PAPs are also assessed under vulnerable groups.

For detailed information on identification of stakeholders of the Project, please refer to Project's specific SEP (CNR-PLN-TULIP-KSR-SEP-001).

Summarized information on PAPs are given in below for each of the village:

6.1.1 Kösrelik Village

- **Age and gender:** Total population of Kösrelik is 471 with 245 men and 226 women. In accordance with the expression of the mukhtar, distribution of population by age groups is almost similar to each other between youth and over-aged individuals.
- **Local residents:** There are permanent 30 households in Kösrelik.
- **Villagers out of Kösrelik:** Kösrelik village has experienced population loss. Most of the population are located in Aydıncık district center, Yozgat Province, İnegöl district of Bursa, Ankara Province, Çorum Province and out of Türkiye. Population change figure is given via Table 6-1).
- **Seasonal agricultural workers:** There is a variable number of seasonal agricultural workers coming to the village from the Urfa region and other villages to work in the onion, potato, and sugar beet fields. Some of these workers stay in the village and some in the district center. Approximately 25 to 30 people can be mentioned.

Table 6-1 Population of Kösrelik (Aydıncık, Yozgat) over the years, TURKSAT 2023

Years	Population	Man Population	Woman Population
2023	471	245	226
2022	441	234	207
2021	482	251	231
2020	486	251	235
2019	527	270	257
2018	557	282	275
2017	563	283	280
2016	560	282	278
2015	558	279	279
2014	629	319	310

6.1.2 Mercimekören Village

- **Age and gender:** Total population of Mercimekören is 46 with 20 men and 26 women. According to obtained data by mukhtar most of the population is consisted by over-aged groups.

- **Local residents:** There are permanent 20 households in Mercimekören. Population change is described as stable. Population change figure is given via Table 6-2.
- **Seasonal agricultural workers:** It has been noted that there are 30 seasonal agricultural workers staying in the village. These individuals are mostly from the Urfa-Siverek region. Seasonal agricultural workers are employed in the potato, onion, and sugar beet fields. They come to the area around April each year and stay for approximately 3 to 4 months.

Table 6-2 Population of Mercimekören (Aydıncık, Yozgat) over the years, TURKSAT 2023

Years	Population	Man Population	Woman Population
2023	46	20	26
2022	42	19	23
2021	38	17	21
2020	40	17	23
2019	47	19	28
2018	47	20	27
2017	48	21	27
2016	49	24	25
2015	49	25	24
2014	55	29	26

6.1.3 Kocabekir Village

- **Age and gender:** Total population of Kocabekir is 78 with 38 men and 40 women. In line with the expression of the mukhtar, number of over-aged individuals are greater than youth people.
- **Local residents:** There are permanent 30 households in Kocabekir.
- **Villagers out of Kocabekir:** There are approximately 200 households who migrated to İnegöl district of Bursa. Population change figure is given via Table 6-3.
- **Seasonal agricultural workers:** There are 15 temporary agricultural workers staying in the village, accommodated in 2 different tents. These workers are families from Urfa. They arrive about 10 days before the season (in April or May) and leave about a month later (in August or September).

Table 6-3 Population of Kocabekir (Aydıncık, Yozgat) over the years, TURKSAT 2023

Years	Population	Man Population	Woman Population
2023	78	38	40
2022	68	34	34
2021	76	37	39
2020	86	44	42
2019	93	49	44
2018	106	53	53
2017	92	46	46
2016	92	43	49
2015	88	42	46
2014	96	44	52

6.1.4 Körpınar Village

- **Age and gender:** Total population of Kocabekir is 16 with 10 men and 6 women. In according to population distribution by age groups, youth population is higher than elderlies.
- **Local residents:** There are permanent 4 households in Körpınar.

- **Villagers out of Körpınar:** There are approximately 8 or 10 households who migrated to Çorum, Izmir, Ankara, İzmir, İstanbul and out of Türkiye. Population change figure is given via Table 6-4.

Table 6-4 Population of Körpınar (Alaca, Çorum) over the years, TURKSAT 2023

Years	Population	Man Population	Woman Population
2023	16	10	6
2022	14	9	5
2021	13	9	4
2020	13	9	4
2019	12	8	4
2018	12	8	4
2017	13	8	5
2016	12	7	5
2015	14	7	7
2014	15	7	8

6.2 Disadvantaged / Vulnerable Individuals or Groups (DVIG)

The term, Disadvantaged / Vulnerable Individuals or Groups (DVIG), pertains to individuals or groups who are at a higher risk of being negatively impacted by the project's effects and may face more constraints than others in harnessing the benefits of a project. Such individuals or groups are also more prone to exclusion from or limitations in their ability to fully participate in the regular consultation process. Consequently, they may necessitate specific measures and assistance to engage effectively. This approach will consider factors related to age, encompassing both the elderly and minors, particularly in situations where they may be separated from their family, community, or other individuals upon whom they depend.

For detailed information on identification of DVIGs of the Project, please refer to Project's specific SEP (CNR-PLN-TULIP-KSR-SEP-001).

In line with the findings of field surveys conducted on February 14, 2024 and August 13, 2024, the vulnerable groups / individuals have been identified as the following headings.

6.2.1 Kösrelik Village

- **Seasonal agricultural workers:** There are approximately 25 to 30 seasonal workers. These workers may be excluded from information activities such as announcements and meetings held during the off-season (April-September). This situation may hinder their effective participation in stakeholder engagement processes. In addition, seasonal workers are accommodated in non-residential areas such as tents. These inadequate living conditions could make them more sensitive to construction impacts such as noise and dust.
- **Disabled individuals:** There is 1 individual with disabilities. Individuals in this and similar situations may be more heavily affected by the temporary access restrictions likely to occur during the construction period.
- **Elderlies:** There are 4 individuals in the elderly age group. Additional measures are required to ensure their participation in information activities.
- **Minorities and non-Turkish speakers:** Although an exact date is not provided, the village's origins trace back to Kurds who migrated from the Malatya Darende region. While there is no issue of not knowing Turkish, the Kurdish language should be considered as a cultural sensitivity.

6.2.2 Mercimekören Village

- **Seasonal agricultural workers:** During the harvest season, approximately 30 seasonal agricultural workers reside in the village and its surroundings. These individuals may be in a vulnerable position due to being excluded from communication activities and inadequate living conditions.
- **Female Household Heads:** There are two female household heads living alone. Additional measures are required to ensure their participation in information activities.
- **Elderlies:** It is mentioned that although an exact number cannot be provided, the majority of the population is in the elderly age group. Additional measures are required to ensure their participation in information activities.
- **Minorities and non-Turkish speakers:** The village is one of the Circassian villages established in the 1864 period. Although there is no issue of not knowing Turkish, the Circassian language should be considered as a cultural sensitivity.

6.2.3 Kocabekir Village

- **Seasonal agricultural workers:** In the village, there are 15 seasonal agricultural workers of Urfa origin staying in two different tents during the harvest season. These individuals may be in a vulnerable position due to being excluded from communication activities and inadequate living conditions.
- **Female Household Heads:** There are three female household heads living alone. Additional measures are required to ensure their participation in information activities.
- **Elderlies:** It is mentioned that although an exact number cannot be provided, the majority of the population is in the elderly age group. Additional measures are required to ensure their participation in information activities.
- **Disabled individuals:** There is 1 individual with disabilities. Individuals in this and similar situations may be more heavily affected by the temporary access restrictions likely to occur during the construction period.

6.2.4 Körpınar Village

- **Minorities and non-Turkish speakers:** Although Kurdish and Arabic speakers use Turkish as the communication language, these languages should be considered as cultural sensitivities. The shepherd working in the village has Arabic as their native language and is also one of the two people in the village who rely on assistance for their livelihood.
- **Female Household Heads:** There is a female household head living alone in the village. She is also one of the two people in the village who rely on assistance for their livelihood. Additional measures will be required to ensure the effective participation of female household heads who live alone in stakeholder engagement activities.

6.3 Livelihood and Employment

The livelihood and employment conditions of the PAPs are listed in the following headings belong to each of the villages.

6.3.1 Kösrelik Village

- **People engaged in agriculture:** All households are engaged in agricultural activities. The produced crops include onion, potato, sugar beet, wheat, chickpeas, and barley. Additionally, each household has apple, pear, quince, cherry, and sour cherry trees grown for subsistence.

- **People engaged in livestock:** Animal husbandry is practiced by nearly all of the households with both cattle and small ruminants. Small ruminant farming is present in three households. There are approximately 700-800 cattle and around 100-150 sheep and goats.
- **People engaged in forestry:** There is forestry activity in the village, but it is done for subsistence purposes. Villagers use oak trees from the forest for firewood through by permission of forestry directorate.

6.3.2 Mercimekören Village

- **People engaged in agriculture:** All households are engaged in agricultural activities and the most commonly produced crops are potato, sugar beet, and white bean.
- **People engaged in livestock:** In the village, 2 households engage in animal husbandry, but this activity is not a commercial enterprise.
- **People engaged in beekeeping:** In the village, 3 to 5 households practice beekeeping, but it does not have commercial value.
- **Unemployed youth:** There are 8 to 10 individuals looking for job.

6.3.3 Kocabekir Village

- **People engaged in agriculture:** Farming is one of the main sources of livelihood, but information on the number of households dependent on agriculture for their livelihood is not available. The most produced crops are onion and potato.
- **People engaged in livestock:** Animal husbandry is observed in 3 households. One household practices cattle farming, while two households engage in small ruminant farming. Although the exact number of cattle is unknown, it is estimated that there are around 300 small ruminants.
- **Unemployed youth:** In accordance with mukhtar expression, despite looking for a job, one young person who cannot find one comes from each of the 30 households.

6.3.4 Körpınar Village

- **People engaged in agriculture:** Nearly all households are engaged in agricultural activities. The most produced crops are potato, onion, sugar beet ,wheat, barley, maize (fodder crop), and sunflower. Vegetables are produced to meet household consumption.
- **People engaged in livestock:** 2 households are involved in livestock farming activities. There are 100 cattle animal. Small cattle farming is not active in the village.
- **People engaged in beekeeping:** There is one household engaged in beekeeping with two hives.
- **Unemployed youth:** There is one individual

6.4 Education and Health Services

The educational and health conditions of the PAPs are listed in the following headings belong to each of the villages.

6.4.1 Kösrelik Village

- **Educational services in the village:** There is no school in the village. Children go to school in the district with transportation. There are 15 students in primary school, 17

students in middle school, 4 students in high school, and about 30 university students.

- **Health service in the village:** There is a health clinic in the village with 1 midwife and 1 nurse.

6.4.2 Mercimekören Village

- **Educational services in the village:** The school is closed. Students travel to Aydıncık.
- **Health service in the village:** There is no healthcare service here. The family doctor used to come once a week, but now it has decreased to once a month.

6.4.3 Kocabekir Village

- **Educational services in the village:** The village has a school, but it is not active. Students go to Aydıncık for school. There are 3 primary school students, 1 middle school student, and 1 high school student.
- **Health service in the village:** Health services are accessed in Aydıncık. Previously, a doctor used to come, but now there is none.

6.4.4 Körpınar Village

- **Educational services in the village:** There is no school in the village. Education is provided in Aydıncık (Primary and Middle School) and Alaca (Middle School).
- **Health service in the village:** There is no health clinic. People go to Alaca. Previously, a doctor used to come, but now there is none.

6.5 Cultural Heritage

Opinion letters have been sent by DSI to the relevant institutions asking for the natural and cultural protected areas. According to official letter sent by Kayseri Provincial Directorate of Environment, Urbanization and Climate Change (since there is no branch directorate for the natural assets) dated 20.12.2022 with number of 5312356, there are no natural assets, natural protected areas or special environment protection zone according to Law on Protection of Cultural and Natural Assets. Similarly, according to official letter with number of 8132054 received on 14.12.2022 from Ministry of Agriculture and Forest, 9th Regional Directorate, Yozgat Branch, the Project area does not remain any of the special plant area, special wildlife area, priority biodiversity area, national park, nature park, nature monument, nature conservation area, wildlife development area, important nature area, important bird area, important plant area or within spatial restrictions related to hunting and game management.

Additionally, an opinion was asked to the Yozgat Museum Directorate by the 12th Regional Directorate of DSI about the archaeological protected areas in the sub-project areas within the scope of TULIP and the spatial restrictions related to these areas, and whether there are any issues not mentioned above that should be taken into account when evaluated from the perspective of the Museum Directorate. According to the official letter numbered 3412468 and dated 23.01.2023 from the Kayseri Cultural Heritage Preservation Regional Board Directorate, it is stated that no historical or archaeological cultural assets or remains have been found in the Project area within the scope of Law No. 2863. In the official letter, it is also stipulated that if any finds or remains are encountered during physical and construction interventions in the area where the construction will be carried out, the works must be stopped in accordance with Article 4 of Law No. 2863 and the nearest Museum Directorate or the Mukhtar in the village and the Civil Administration Chiefs in other places must be notified within 3 days at the latest.

To conclude, there are no archaeologically or natural protected areas and/or cultural assets within and around the Project area. If any archaeological remains or objects are found, the construction activities will be stopped, and the Yozgat Museum Directorate will be informed immediately pursuant to Article 4 of the Law No. 2863 as also elaborated in Chance Find Procedure of Appendix-5 of this ESMP.

According to the findings of the interviews with the mukhtars, there has been no mention of the presence of any cultural heritage elements (such as shrines, tombs, visitation sites, graves, wish trees, etc.). However, it is thought that traditional clothing and household goods, may be protected within the homes by members of the households in Mercimekören village. Therefore, intangible cultural heritage elements may also be encountered in Mercimekören village. In such case, Chance Find Procedure will be implemented as mentioned previously.

6.6 Traffic and Transportation

For reaching the Project area, D200/E88 and D795 roads from Yozgat province and village and state roads from Aydıncık district are used (see Figure 6-1 and Figure 6-2).

When the 2023 Traffic Volume Map of KGM 6th Regional Directorate (Kayseri) is examined, it is observed that there is no direct state road/highway passing through Kösrelik Village or other close villages (see Figure 6-3[46]), and there is no traffic volume map prepared specific to Aydıncık district. It can be concluded that the road passing through the Project area is used generally by the villagers and the existing traffic load of the village is very low (less than 1467 vehicles/day).

[46] 6th Regional Directorate (Kayseri), Traffic Volume Map of KGM for 2023. https://www.kgm.gov.tr/Sayfalar/KGM/SiteTr/Trafik/TrafikHacimHaritalari2023.aspx

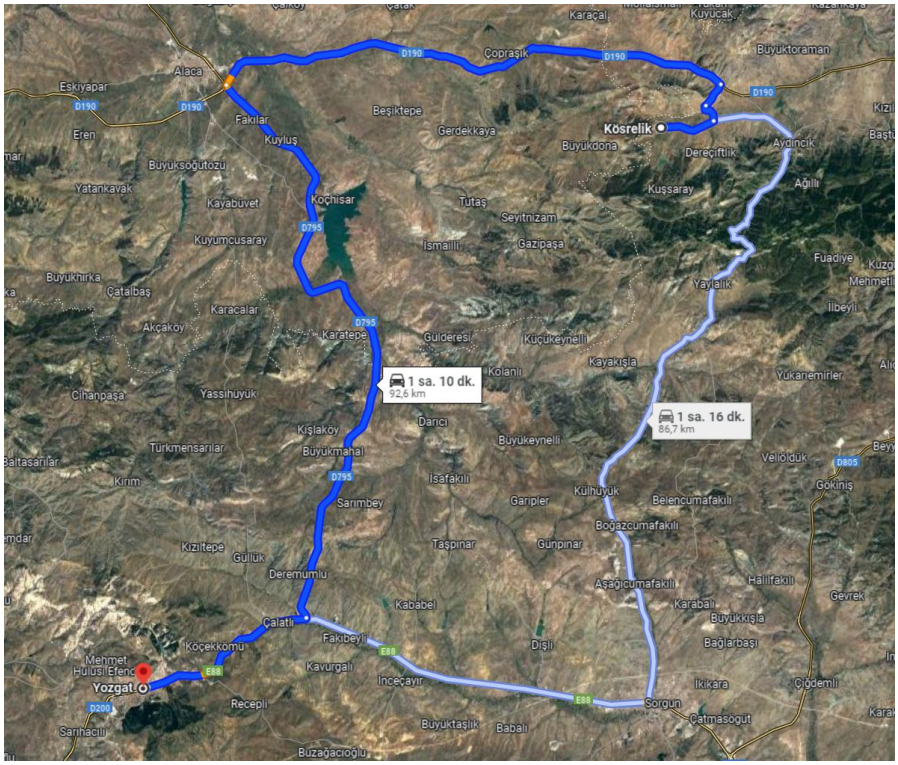

Figure 6-1. Navigation Map from Yozgat Province[47]

Figure 6-2. Navigation Map from Aydıncık District[47]

[47] Screenshots taken from Google Maps

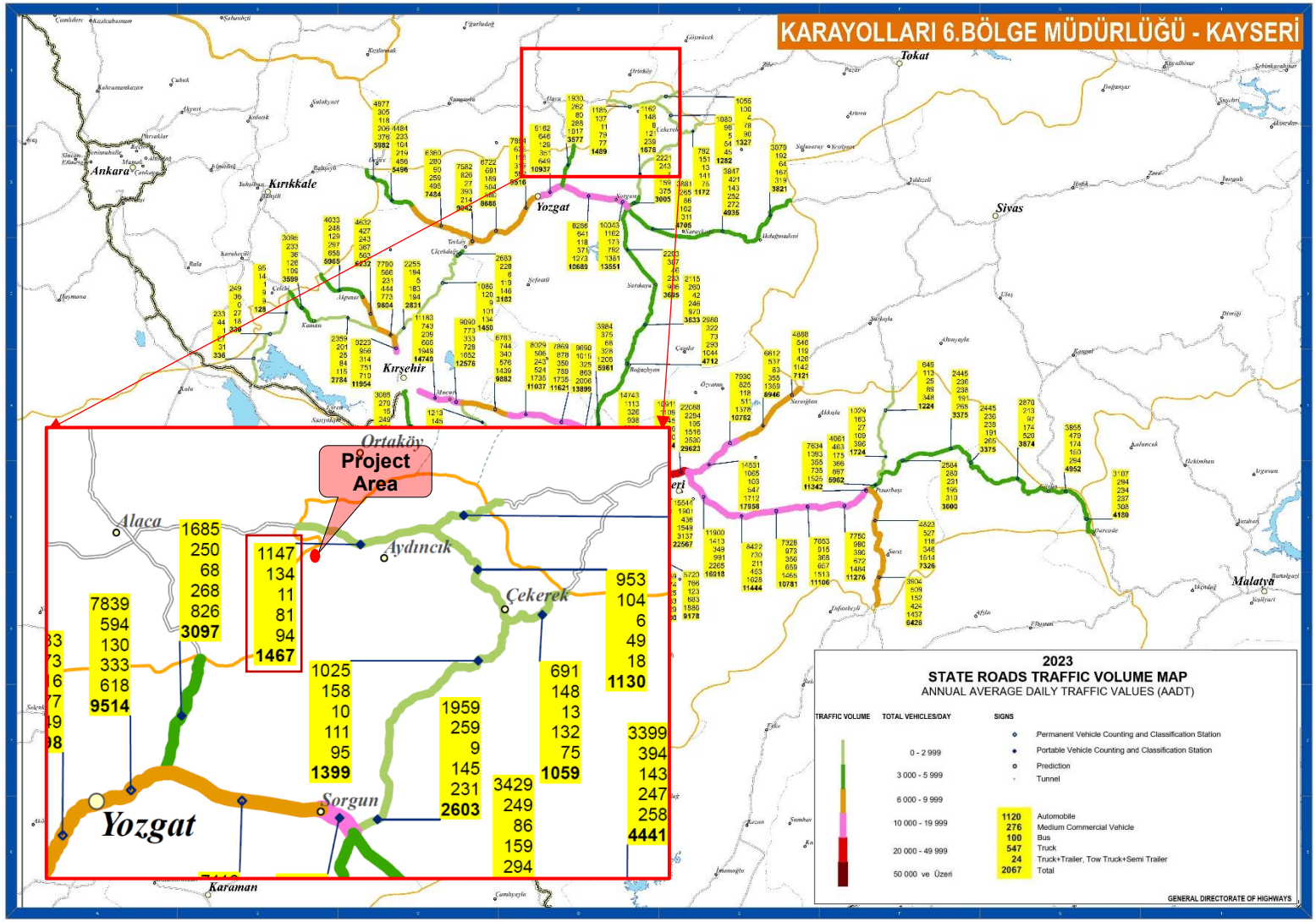

Figure 6-3. Highways Traffic Volume Map (2023)[46]

7 ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

7.1 Area of Influence

In the EIA Regulation published in the Official Gazette dated 29.07.2022 and numbered 31907, the area of influence is defined as "the area affected by a project planned to be realized before, during and after operation".

The environmental and social assessment is defined in WB ESS1 (Assessment and Management of Environmental and Social Risks and Impacts) Paragraph 23 as:

"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 ESS2-Paragraph 10."

So, the area of influence encompasses, as appropriate:

- The area likely to be affected by: (i) the project[48] and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project;[49] (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.
- Cumulative impacts[50] that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

Within the Area of Influence (AoI), the potential impacts of the Project's construction and operation activities on air quality, water resources, noise level, waste management, soil pollution and biodiversity were investigated.

In addition, estimated amount of air emissions, noise level increase, water use and wastewater generation from pre-construction, construction and operation activities have also been provided. The calculated values were compared with the limit values in national legislation and WBG EHS guidelines.

Assessments regarding the environmental and social risks and impacts that are foreseen to occur within the scope of the Project's pre-construction, construction and operation activities are presented under the relevant sections of the ESMP.

[48] Examples include the project's sites, the immediate airshed and watershed, or transport corridors.
[49] Examples include power transmission corridors, pipelines, canals, tunnels, relocation and access roads, borrow and disposal areas, construction camps, and contaminated land (e.g., soil, groundwater, surface water, and sediments).
[50] Cumulative impacts are limited to those impacts generally recognized as important on the basis of scientific concerns and/or concerns from Affected Communities. Examples of cumulative impacts include incremental contribution of gaseous emissions to an airshed; reduction of water flows in a watershed due to multiple withdrawals; increases in sediment loads to a watershed; interference with migratory routes or wildlife movement; or more traffic congestion and accidents due to increases in vehicular traffic on community roadways.

The construction activities will be performed along with the irrigation pipelines on relatively narrow routes (maximum 6-m-wide) and mostly in agricultural lands. Moreover, the main associated facility is the Kösrelik Pond located west site of the Project area. A 150-m outer boundary from the the Project's irrigation area covering the backup, tertiary and discharge pipelines to be installed to the main pipelines and Kösrelik Pond is determined as the Project AoI. The satellite image of the AoI has been given in Figure 7-1[51].

Additionally, the satellite images of the closest sensitive receptors have been shown in Figure 7-2, Figure 7-3 and Figure 7-4.

The distances from the project areas to the nearest sensitive receptors are presented in Table 7-1.[51]

Table 7-1. Distances from the Project Areas to the Nearest Sensitive Receptors[52]

Name of the Nearest Receptor	Distance to the Project Area (m)
H-6	18
H-4	50
H-5	90
H-3, H-12, H-15	130
H-13	180
H-1	200
H-2, H-16	230
School	240
H-7, H-11	270
M-4	280
H-10, H-14, H-17	290
M-2, H-8	300
H-9	330
M-3	380
M-1	420

[51] Prepared by using Google Earth Pro, 2024
[52] Measured by using Google Earth Pro, 2024

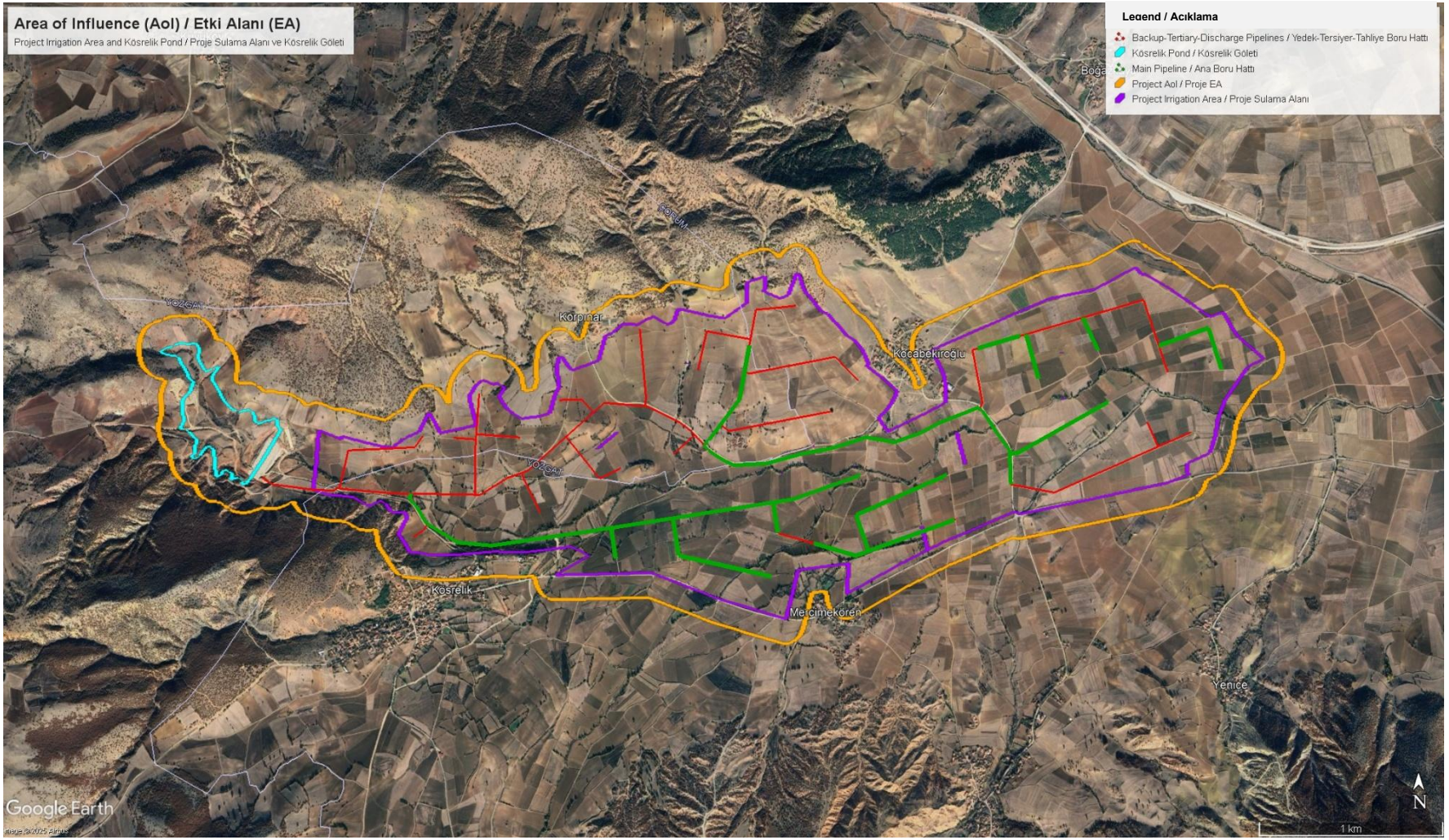

Figure 7-1. Satellite Image of the Project AoI

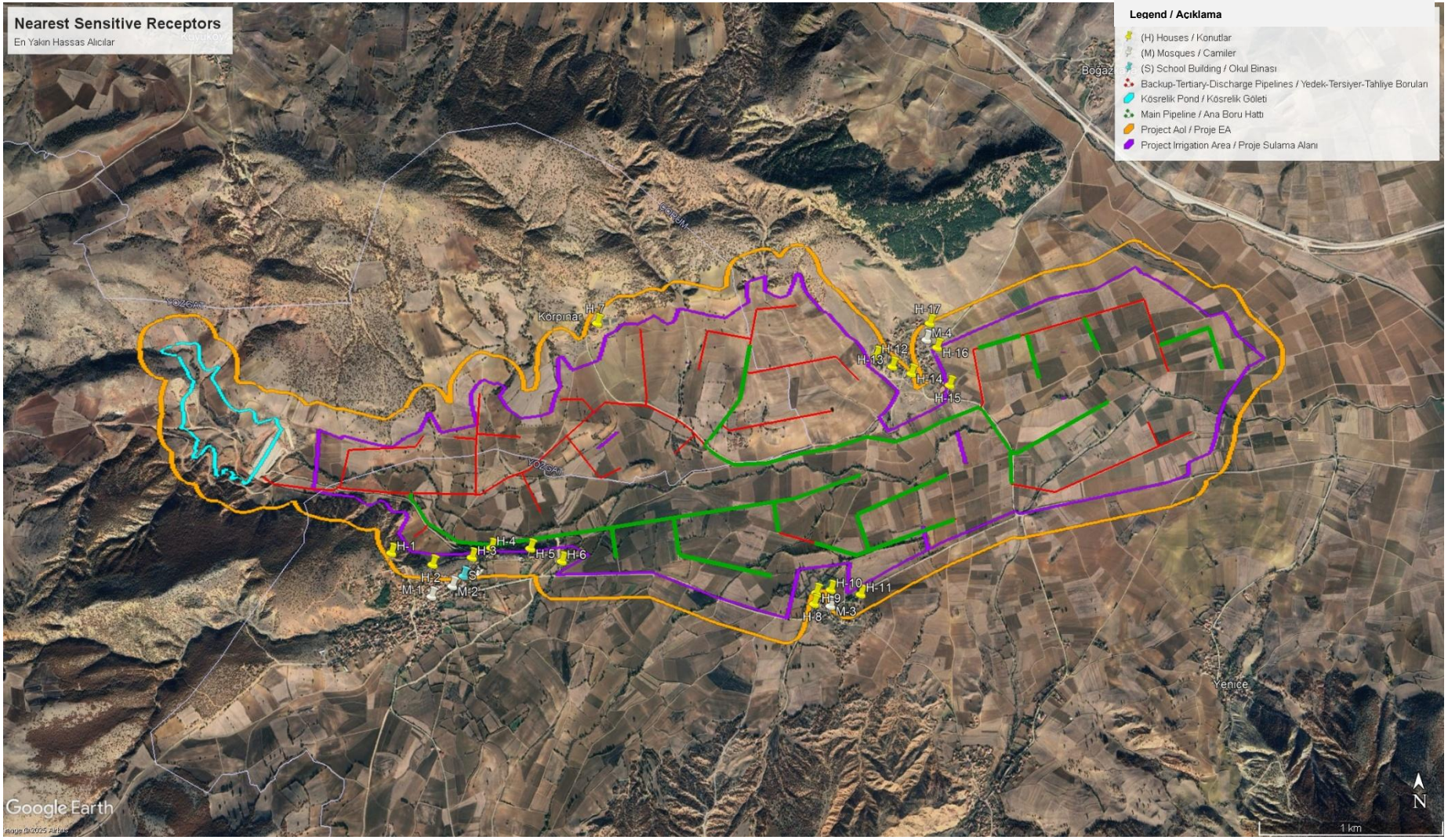

Figure 7-2. Nearest Sensitive Receptors (General View)

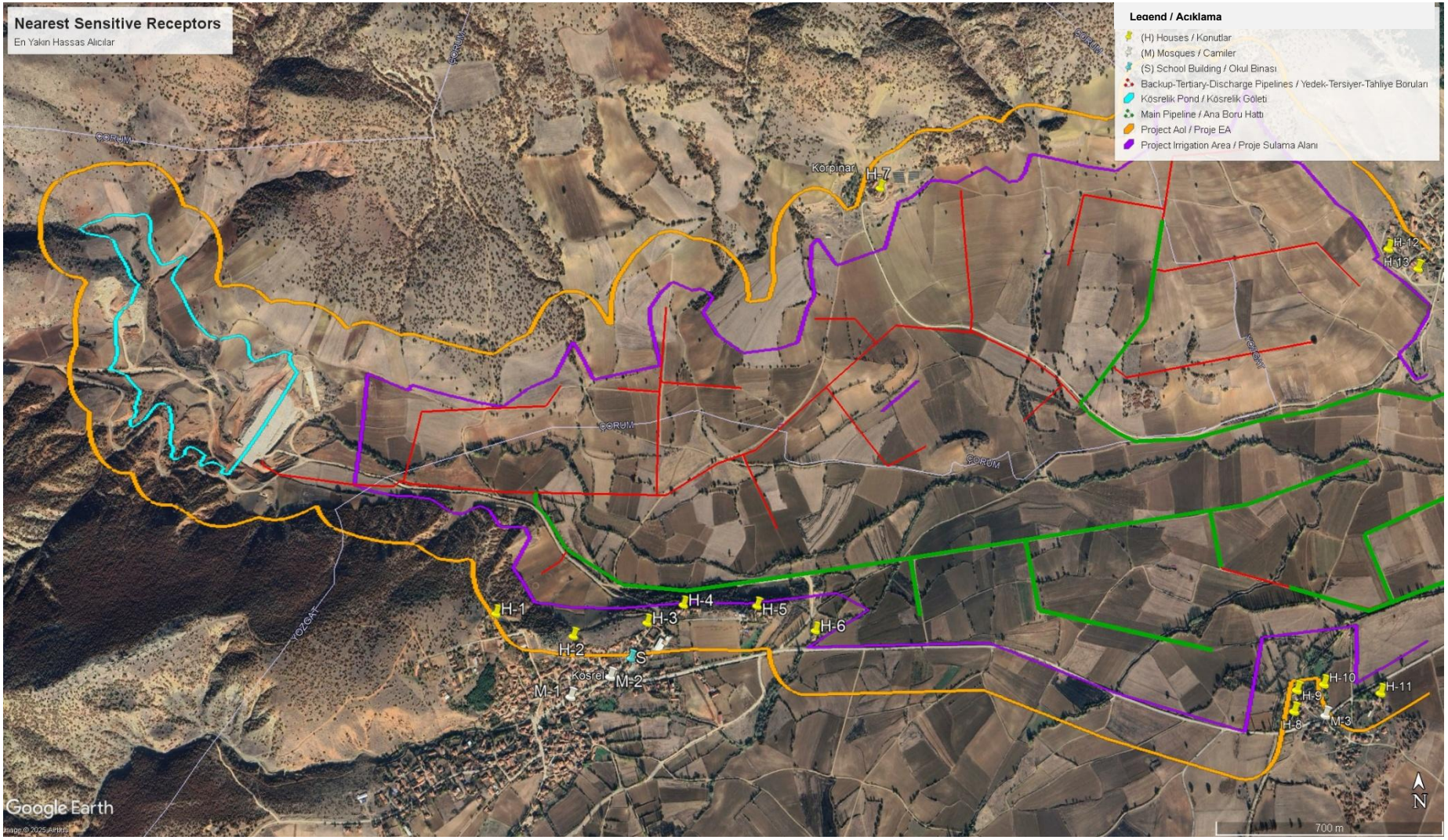

Figure 7-3. Nearest Sensitive Receptors (Kösrelik and Körpınar)

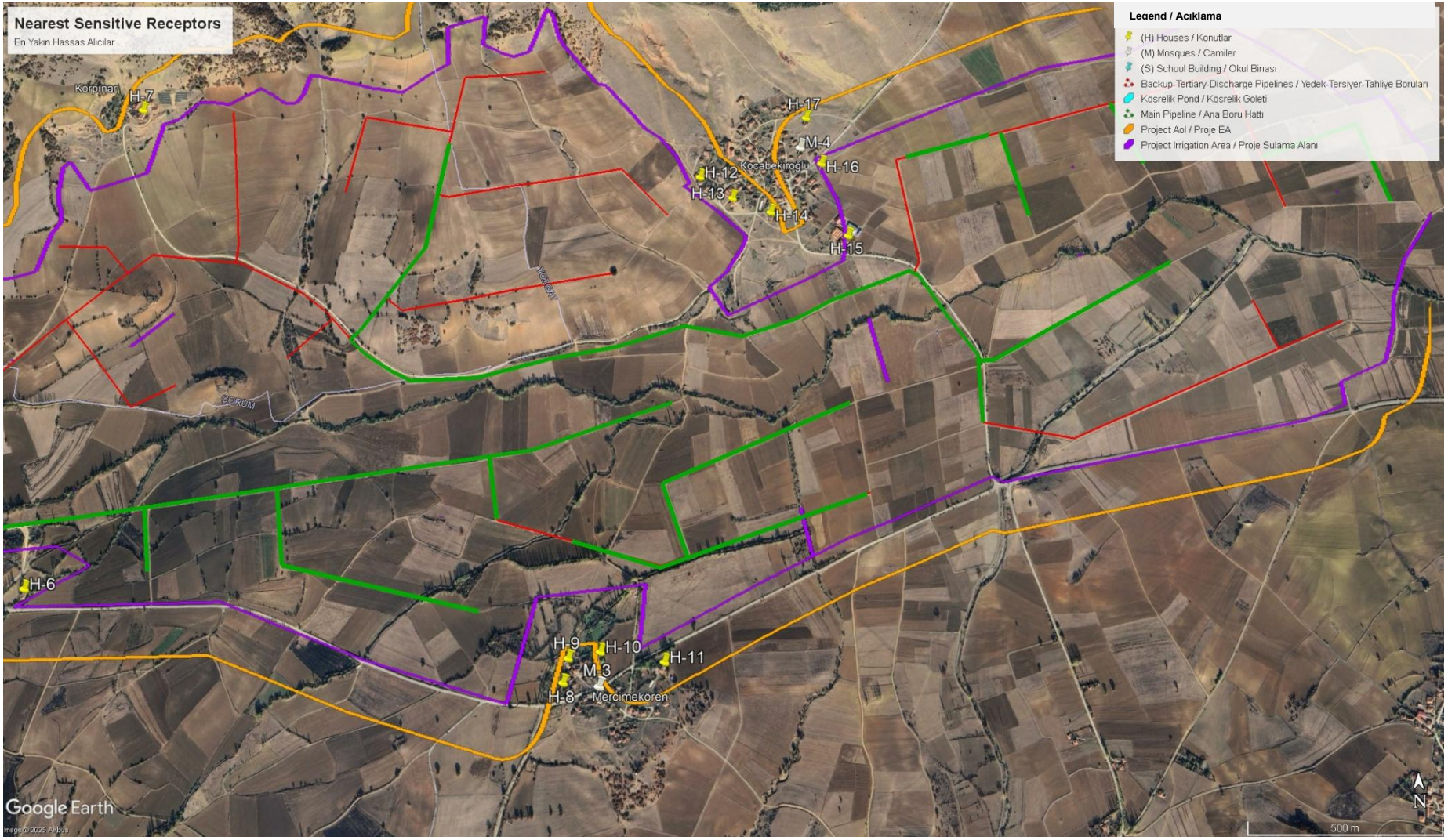

Figure 7-4. Nearest Sensitive Receptors (Mercimekören and Kocabekiroğlu)

7.2 Environmental Risks and Impacts

7.2.1 Change in Land Use and Soil Quality

The Project activities will be performed on very low-rate or dry streams with sediment due to the climate conditions and previous flooding events.

7.2.1.1 Construction Phase

The project area is mostly located in agricultural lands, which can be considered as a modified area. Some parts of the irrigation network route remain on private lands, while other parts of the channel remain on unregistered lands. Except for the private lands, the impact significance of the change in land use determined as minor since the project area is located within a modified area. Moreover, the irrigation network pipeline will be installed underground. Therefore, the users of the agricultural lands can continue to cultivate their lands.

For the private parcels property expropriation processes will be conducted. This issue will be examined separately in the Resettlement Plan (RP) and under Section 7.3.1.

According to the information obtained from the relevant Project Introduction Files of the material quarries to be used during the construction phase of Kösrelik Pond, which is an associated facility, the F-1 permeable material quarry area is classified as “Agricultural Land” according to the 1/100.000 scale environmental layout plan of Yozgat-Sivas-Kayseri Planning Region, the K-1 rock material quarry area is classified as “Meadow and Pasture Areas” according to the 1/100. 000 scale Environmental Plan of Samsun-Çorum-Tokat Planning Region and Limestone material quarry area is within the scope of “Forest Land and Agricultural Land” when evaluated within the scope of “Yozgat-Sivas-Kayseri Planning Region 1/100.000 scale Environmental Plan”. It is stated in the Project Introduction Files that the allocation procedures will be completed, and permission will be obtained from the relevant institutions and organizations before starting the activities in the quarries, and that no activity will be started without permission. At the end of the construction of the Kösrelik Pond, the material quarries will be closed, and the relevant areas will be rehabilitated as described in the Project Introduction Files.

Moreover, the excavation activities will have some minor impacts on the soil environment. However, these impacts are on Project footprint and restricted to the construction sites. The potential impacts on soil and soil quality are as follows:

- Leakage and spill of fuels, oils to be used for the construction machinery and equipment and or chemical/hazardous materials,
- Uncontrolled storage or disposal of solid and/or liquid wastes can cause soil pollution.
- Piling of soil and improper reinstatement of soil to its original position.

Risk of accidental spillages that will be managed with appropriate mitigation measures. Adequately sized secondary containment will also be provided for hazardous substances such as fuel tank and oil barrels that may leak. Also, in case of breakdown of vehicles, during the mandatory maintenance/repair activities to be carried out in the field, laying tarpaulins against spills in the work area, keeping spill kits, providing bottom pans under liquid equipment are also provided by the Contractor. Along the irrigation route, topsoil (vegetative soil) will be stripped to a total width of 12 m (6 m for the pipeline and 6 m for the operation and maintenance road) and a depth of 30 cm. Topsoil will be stored temporarily on the pipeline with a maximum height of 2 m and a maximum slope of 45 degrees. Trenches of 1.5 m width will be excavated on the opened pipeline. The subsoil material from the excavation will be temporarily stored in a way that it will not mixed with the topsoil, after the pipes are placed in the trenches, they will first be backfilled with subsoil and finally the topsoil of the

pipeline side will be laid back. The excess subsoil will be stored in excavation storage areas to be approved by the Municipality or the District Governorship within the scope of the relevant regulation [53]. In the section stripped for the Operation and Maintenance Road, the topsoil will not be laid back, and the topsoil obtained from here will be used primarily to meet the demands of the local people or for landscaping the areas that will be needed. This process will only occur on the specific route where the irrigation pipes will be placed, and it will account for a very small portion of the entire irrigation area.

The mitigation measures regarding the above-mentioned risks and impacts are given in the Chapter 8. With the implementation of those measures, the impact significance will be minimized to acceptable levels.

7.2.1.2 Operation Phase

During the operation phase, there will not be any change in land use impact, but there might be soil contamination / change in soil quality risk due to the maintenance and repair activities. Those impacts will be similar to the construction phase and by implementing the mitigation measures given in Chapter 8, this risk will be minimized to a negligible level.

During the planning phase of Kösrelik Pond construction, sample was taken from Kösrelik Pond Axis (Özdere stream) and pH, electrical conductivity, cation (Na^+, K^+, Ca^{++} and Mg^{++}) and anion ($(CO_3)^=$, $(HCO_3)^-$ Cl^- and $(SO_4)^=$) values and Boron concentration were examined and irrigation water class was determined as T3A1 (high saline low sodium water). According to the boron concentration in the water, it was determined that the water quality was suitable for first class irrigation for sensitive plants. Within the scope of the Project, an efficient irrigation system will be created with different irrigation methods for different crop patterns. When used with appropriate drainage and cultural practices, it is anticipated that there will be no adverse effects on the physical and chemical properties of the soils in the project area.

Risks/impacts arising from use of pesticides for the agricultural activities during operational phase are explained in relevant sections of this ESMP.

7.2.2 Water Resources and Use

7.2.2.1 Construction Phase

The Project

There will be no use of natural water resources (surface water, groundwater, etc.) and no discharge to water resources within the scope of the Project, and no negative impact on any natural water resources is expected due to Project activities.

During the construction phase, there will be a need for drinking water and domestic water from personnel. The water needs of the Project villages are met from the groundwater near Özdere stream.

It is expected that the domestic water needs of the personnel will be met from the municipal network or supplied from the mobile construction site. This situation will be clarified after the determination of the Contractor company before the construction phase of the project. In case the water supply for the personnel is provided from the municipal network, it will be provided by Yozgat Municipality Water and Sewerage Operation Directorate. In case a mobile construction site is established, domestic water will be supplied from the municipal water network connection point closest to the mobile construction site.

[53] Regulation on Control of Excavation Soil, Construction and Demolition Wastes (O.G. Date 18.03.2004, O.G. Number: 25406)

The drinking water requirement of the personnel will be purchased from the market as carboy water.

According to TurkStat data for the year 2022, the daily water withdrawal per capita in Yozgat province is 243 l/person-day and the daily use water requirement for 20 personnel to be employed during the construction phase is as calculated below.

Total Amount of Water Requirement = Number of Personnel x Daily Water Withdrawal per Capita

= 20-person x 243 lt/person-day

= 4,860 lt/day

= 4.86 m^3/day

Since the working time for the construction phase is 10 hours per a day: = 4.86 m^3/day x (1 day/10 hr)

= 0.486 m^3/day

During the project construction phase, irrigation will be conducted at regular intervals in the Project area to minimize dust emissions that may arise from activities such as construction vehicle movements. It is planned to supply water by trucks. It is predicted that 2 m^3/day water will be used for watering activities for dust suppression. As the water will evaporate, no wastewater generation is predicted.

Material Quarries

Water will be used by the personnel working in the material quarries, and for irrigation works to be carried out for dust prevention. The drinking water of the personnel will be supplied as bottled water from the market and the utility water will be brought to the site by tankers from nearby villages or by purchasing from the market. For the use of village water, permission will be obtained from the village mukhtars before starting the activity. In case surface waters are used, necessary permits will be obtained from DSI 12th Regional Directorate. The water usage calculated in the Project Introduction Files is summarized in Table 7-2 below.

Table 7-2. Water requirement for the material quarries

Purpose of Use	Total Amount of Water Requirement (m^3/day)	
	F-1 and K-1 Material Quarries (total)	Limestone Quarry
Personnel use	4.05	3.36
Dust suppression, irrigation activities	2	10
Ready-mixed concrete batching plant	90	-
Washing-screening plant (Daily addition)	27.1	-
Total	**123.15**	**13.36**

7.2.2.2 Operation Phase

The operation of the irrigation network Project will be responsibility of an irrigation union, which has not been determined yet. It is estimated that 5 personnel will be working in this union responsible for the irrigation network operation.

The drinking water requirement of the personnel will be purchased from the market as carboy water. It is estimated that the utility water of the personnel will be supplied by tankers purchased from Aydıncık Municipality.

Accordingly, the amount of utility water to be used by the personnel during the operation phase will be:

Total Amount of Water Requirement	=	Number of Personnel x Daily Water Withdrawal per Capita
	=	5-person x 243 lt/person-day
	=	1,215 lt/day
	=	1.215 m^3/day
Since the working time for the operation phase is 8 hours per a day:	=	1.215 m^3/day x (1 day/8 hr)
	=	0.15 m^3/day

The Project aims to irrigate 597 ha gross and 537 ha net area to agricultural lands in Kösrelik, Kocabekir, Mercimekören and Körpınar villages., and the total amount of water to be allocated for irrigation is estimated to be 3.164 hm^3/year. To eliminate the unnecessary usage of the water resources, which will be obtained from Kösrelik Pond being constructed on Özdere stream, specialized irrigation systems including sprinkler, dripping and release systems will be installed to the system within the scope of the Project. Therefore, no adverse impact on Özdere stream is expected during the Project's operation phase.

7.2.3 Wastewater Management

7.2.3.1 Construction Phase

The Project

It is assumed that all (100%) of the water used by personnel during the project construction phase will be converted into wastewater. Accordingly, 0.486 m^3/day of wastewater will be generated during the construction phase.

Within the scope of the project, domestic wastewater generation will occur only during the construction phase. During the construction phase, domestic wastewater disposal from personnel will be provided from the nearest facility or village social facility buildings or by placing mobile toilets. Moreover, impermeable septic tanks will be constructed at the construction site and/or camping area.

Within the Project's scope, if mobile toilets are located in the construction areas, these mobile toilets will have their wastewater collection reservoir. In case mobile toilets are installed or impermeable septic tank is constructed, an agreement will be made with Çekerek Municipality, and the wastewater sent by vacuum trucks to the licensed Çekerek WWTP since there is no licensed WWTP in Aydıncık District.

If mobile toilets are used, Contractor will make an agreement with the Çekerek Municipality regarding using sewage trucks, or an official letter should be sent to explain the situation.

The water requirement during the construction phase of the Project, the amount of wastewater generated, and the disposal method are summarized in Table 7-3.

Table 7-3. Construction Phase Water Usage and Disposal Method[54]

Purpose of Use	Supply	Requirement of Water (m^3/day)	Amount of Wastewater (m^3/day)	Disposal Method
Personnel domestic and drinking water	Municipal water network and market	0.486	0.486	Mobile toilet septic tank/impermeable septic tank
Land irrigation for dust prevention	Transported water	2	Evaporation	Not necessary
Total		**2.486**	**0.486**	

Material Quarries

The amount of wastewater to be generated in the material quarries has been calculated in the relevant Project Introduction Files. It is estimated that all of the drinking water to be used by the personnel in F-1 and K-1 material quarries will be converted into domestic wastewater and the total amount of wastewater will be 4.05 m^3/day, and 2.82 m^3/day domestic wastewater will be generated by the personnel in limestone material quarries. Thus, the total amount of domestic wastewater generated by the personnel in the material quarries is 6.87 m^3/day.

All of the irrigation water to be used for dust suppression in the material quarries will evaporate under the influence of the sun and no wastewater generation will be observed.

Since the water to be used in the ready-mixed concrete plant will be incorporated into the structure of the concrete to be produced, no wastewater will be generated. After the concrete casting operations of the transit mixers to be used within the scope of the project are completed, a 3-compartment settling pool will be built in the area to be created for washing the vehicles. The reuse of the water accumulated in the clear layer on the surface of the settling pool will be taken into consideration and will be given to the ready-mixed concrete production facility.

Some of the water to be used in the washing-sieving plant will remain on the surface of the material and will be removed from the material by evaporation. Therefore, the water remaining on the surface of the material will not generate wastewater. Water use in the washing-screening plant will be by recirculation method, so water use will be observed at lower levels than the calculated amount. Although there is no wastewater formation in systems operating with the recirculation method, the fact that no chemicals are used during the washing of the material allows the water to be used in the system to circulate continuously in the system.

In the Project Introduction Files, it is stated that wastewater from all material quarries will be collected in sealed septic tanks and sent to licensed wastewater treatment plants by the nearest municipality's vacuum trucks.

7.2.3.2 Operation Phase

The operation of the irrigation network Project will be responsibility of an irrigation union, which has not been determined yet. It is estimated that 5 personnel will be working in this union responsible for the irrigation network operation.

[54] The calculations made by using relevant TurkStat data are summarized.

It is assumed that all (100%) of the water used by personnel during the project construction phase will be converted into wastewater. Accordingly, 0.15 m^3/day of wastewater will be generated during the operation phase.

It is estimated that an impermeable septic tank will be constructed by the irrigation union for the personnel who will be responsible for the operation of the Kösrelik Pond and the irrigation network Project. The wastewater generated and collected in the septic tank will be emptied by vacuum trucks and sent to Çekerek WWTP since there is no licensed WWTP in Aydıncık District. The irrigation union to be selected for the operation of the Project should make an agreement/protocol with the Çekerek Municipality regarding the issue.

In the Project area, which has no ground water problem, a surface drainage system is proposed on 152 ha, which is 25.38% of the total area, to remove surface water from irrigation and precipitation from the project area. Likewise, due to the soil and topography, 74.29% of the 445 ha area was included in the farmers' ditches system.

The natural drainage of the area is provided by İğdeli Stream and Özdere Stream and the dry side streams that connect to these streams. The depth of Özdere Stream at the entrance and exit of the project area is 2.0 m and its width is 3.0 m. The Iğdeli Stream has a width of 2.5 m and a depth of 2.0 m. Surface waters formed after precipitation can be removed from the project area by these streams without damaging the project area. These streams, which provide the main discharge, have sufficient cross-section to create suitable outlet conditions for surface drainage channels and farmer ditches to be opened. Distribution of Drainage System Areas[55] are summarized in Table 7-4.

Table 7-4. Distribution of Drainage System Areas

Unit	Area (ha)	Distribution (%)
Farmer ditch areas	445	74.29
Surface drainage areas	152	25.38

Moreover, the irrigation system to be installed within the scope of the Project will provide effective irrigation methods (sprinkler, dripping and release systems) to eliminate the over irrigation of the crops.

7.2.4 Waste Management

7.2.4.1 Construction Phase

During the construction phase of the Project, solid waste from materials, installations, and personnel is expected to be generated, and the amount of waste to be generated is expected to be low.

The personnel employed at the site during the construction phase will cause the generation of domestic solid waste, particularly organic waste. It is estimated that approximately 20 personnel will be employed during the construction phase of the project. According to TurkStat 2022 data, the average amount of municipal waste per capita is 1.16 kg. Accordingly, the amount of daily domestic solid waste that will be generated during the construction phase of the project is calculated below:

Total Amount of Domestic Solid Waste Generation = Number of Personnel x Average Domestic Soil Waste Generation

= 20 x 1.16 kg/day

[55] Kösrelik Pond and Irrigation Planning Report, November 2013

= 23.2 kg/day

Domestic solid wastes generated within the scope of the Project will be temporariliy stored in waste containers in the site. Yozgat Special Provincial Administration is responsible for the disposal of domestic solid waste in Kösrelik, Kocabekir and Mercimekören villages, and wastes are collected once a week in the region. However, no domestic waste collection is performed in Körpınar village, the villagers either collect their waste and bring it to nearest village which receives domestic waste collection service or burn it.

Domestic solid wastes generated by the Project employees will be sent to Yozgat Regular Storage Facility with licensed vehicles, and the Contractor will make necessary agreements with the transfer firm and the licensed storage facility.

During the construction phase, the packaging wastes to be generated are paper-cardboard, plastic, glass, etc. Assuming that the quantity of packaging waste generated will be approximately 20% of the total quantity of domestic solid waste, the amount of packaging waste for the construction phase is 4.64 kg/day.

The excavation soil will be used as a filling material as much as possible. Therefore, a temporary storage area will be designated by the Contractor within the Project area. If the excavation soil is not suitable for using as filling material, the excavation waste will be collected in the storage area, and it will be transported for transfer to the disposal sites approved by the Aydıncık Municipality at the end of construction or at an earlier date. The Contractor will be responsible for the storage of other wastes to be generated during the construction phase and sending them to licensed companies. A clause will be added to the contract between the contractor and waste collection firm stating that the management of the waste generated by the project is the responsibility of the contractor.

All maintenance procedures concerning the excavation process will adhere to the regulations stipulated in the Regulation on the Control of Excavation Soil, Construction, and Debris Wastes Law No. 25406 (18.03.2004).

Wastes to be potentially generated during the construction phase of the Project are given in Table 7-5. Moreover, a Waste Management Plan (WMP) has been prepared and attached as Appendix-6.

Table 7-5. Construction Phase Waste Generation and Disposal Information[56]

Waste Code	Description of the Waste	Source	Characteristic	Disposal
20 03 01	Mixed Municipal Waste	Project Personnel Activities	Non-hazardous	Domestic solid waste will be stored in closed containers located in the region and then disposed of through the Yozgat Special Provincial Administration waste collection system. All activities will comply with the Waste Management Regulation Law No. 29314 (02.04.2015).
15 01 01	Paper-cardboard	Packaging Waste from Construction Materials and Personnel	Non-hazardous	Packaging waste resulting from personnel and construction activities will be collected separately from domestic solid waste and transferred to licensed collection, sorting, or recycling companies. Compliance with the Packaging Waste Control Regulation Law No. 31523 (26.07.2021) will be ensured.
15 01 02	Plastic Packaging			
15 01 03	Wooden Packaging			
15 01 07	Glass Packaging			
15 01 04	Metal Packaging			
16 01 03	End-of-Life Tires	Construction machines and equipment	Non-hazardous	The contractor company is responsible for the maintenance, repair, and service of the machines used. All end-of-life tires will be disposed of in accordance with the Waste Tire Control Law No. 29292 (11.03.2015).
16 06 05	Waste Batteries and Accumulators	Construction machines and equipment	Non-hazardous	The contractor company is responsible for the maintenance, repair, and service of the machines used. Necessary maintenance, repair, and service operations will be conducted. If waste accumulators are generated in the project area, they will be sent to authorized companies or licensed hazardous waste recycling facilities in accordance with the Law No. 29214 on the Control of Waste Batteries and Accumulators (14.01.2015).
16 01 07*	Oil filters	Construction machines and equipment	Hazardous	The contractor company is responsible for the maintenance, repair, and service of the machines used. Necessary maintenance, repair, and service operations will be conducted. In case this type of waste is generated in the project area, they will be sent to authorized companies or licensed hazardous waste recycling facilities.
13 02 08*	Other engine, transmission, and lubricating oils	Construction machines and equipment	Hazardous	The contractor company is responsible for the maintenance, repair, and service of the machines used. Necessary maintenance, repair, and service operations will be conducted. In case this type of waste is

[56] It has been benefited from the Waste Management Regulation and its annexes.

Waste Code	Description of the Waste	Source	Characteristic	Disposal
				generated in the project area, they will be sent to authorized companies or licensed hazardous waste recycling facilities.
15 01 10*	Packaging materials containing residues of hazardous substances or contaminated with hazardous substances	Packaging Waste from Construction Materials	Hazardous	In case this type of waste is generated in the project area, they will be sent to authorized companies or licensed hazardous waste recycling facilities.
15 01 11*	Metallic packaging materials containing hazardous porous solid structure (e.g., asbestos), including empty pressure vessels	Packaging Waste from Construction Materials	Hazardous	In case this type of waste is generated in the project area, they will be sent to authorized companies or licensed hazardous waste recycling facilities.
17 05 04	Excavation Materials	Excavation Works	Non-hazardous	Excavation waste generated during the construction phase will be stored in an area to be determined near the project area and approximately 50% of it will be used as back-filling material. Unusable excavation wastes will be sent to the licensed landfill areas determined by the Municipality by making an agreement. The responsibility for the agreement belongs to the contractor.
17 05 03*	Contaminated soil	Incidents	Hazardous	In case this type of waste is generated in the project area, they will be sent to authorized companies or licensed hazardous waste management facilities.
15 02 02*	Contaminated wastes (rag)	Incidents/maintenance	Hazardous	In case this type of waste is generated in the project area, they will be sent to authorized companies or licensed hazardous waste management facilities.
15 01 10*	Contaminated packaging	Incidents/maintenance	Hazardous	In case this type of waste is generated in the project area, they will be sent to authorized companies or licensed hazardous waste management facilities.
17 01 01	Concrete residue	Works	Non-hazardous	It will be stored in a designated area near the project area and will be disposed of through contracted licensed companies.

7.2.4.2 Operation Phase

The operation of the irrigation network Project will be the responsibility of an irrigation union, which has not been determined yet. It is estimated that 5 personnel will be working in this union responsible for the irrigation network operation. Accordingly, 5.8 kg/day waste will be generated during the operation phase and 1.16 kg/day of this waste will be packaging waste.

No regular excavation is expected during the operation phase, it will be conducted only in case of a malfunction or maintenance. Therefore, excavation waste of operation phase is not included in the assessment as the duration and timing of the excavation is unknown and the scope of the excavation works is expected to be very low compared to the construction phase. In case an excavation waste is generated during the operation phase, it will be sent to licensed landfills by licensed companies, and this will be the irrigation union's responsibility.

The waste generated will be stored in a determined area during the operation phase and sent to licensed companies for recycling/disposal. The amount of waste will vary depending on the activities. The number of the personnel will be low and no additional activities such as construction or excavation with heavy machinery and equipment will be performed. Furthermore, the irrigation network will be run by the gravity so there will not be any pumps that need to be maintained or repair. Thus, the significance of the impact will be low for the operation phase.

Potential wastes to be generated during the operation phase of the Project are given in Table 7-6. Moreover, a WMP has been prepared and attached as Appendix-6.

Table 7-6. Operation Phase Waste Generation and Disposal Method[56]

Waste Code	Description of the Waste	Source	Characteristic	Disposal
20 03 01	Mixed Municipal Waste	Project Personnel Activities	Non-hazardous	Domestic solid waste will be stored in closed containers located in the region and then disposed of through the Yozgat Special Provincial Administration waste collection system. All activities will comply with the Waste Management Regulation Law No. 29314 (02.04.2015).
15 01 01	Paper-cardboard	Packaging Waste from Personnel activities	Non-hazardous	Packaging waste resulting from personnel activities will be collected separately from domestic solid waste and transferred to licensed collection, sorting, or recycling companies. Compliance with the Packaging Waste Control Regulation Law No. 31523 (26.07.2021) will be ensured.
15 01 02	Plastic Packaging			
15 01 03	Wooden Packaging			
15 01 07	Glass Packaging			
15 01 04	Metal Packaging			
17 05 04	Excavation Materials (if any)	Excavation Works (if any)	Non-hazardous	Excavation waste generated during the operation phase maintenance/repair works will be stored in an area to be determined. Unusable excavation wastes will be sent to the licensed landfill determined by the Municipality by making an agreement. The responsibility for the agreement belongs to the irrigation union.

7.2.5 Air Quality

Within the scope of the project, construction activities will be conducted on the irrigation pipeline route. In consequence, during the construction phase of the project, dust emissions from excavation works and exhaust emissions from the construction equipment used for the project are expected to occur. In this section, possible dust emissions and exhaust emissions

that may occur during the construction phase are calculated according to worst case scenario which have been assumed that the excavation activities will be performed along with the whole lengths of the pipelines, and the impact of the project activities on the current air pollution level is evaluated.

7.2.5.1 Construction Phase

Excavation works will be conducted on the route of the irrigation pipeline network, and dust and exhaust gas emissions will occur from construction machinery/equipment to be used in construction works.

Construction activities are expected to be completed within 18 months. Dust emission calculations from construction activities in the Project Area are based on the assumption that 20 workers will work 10 hours a day. Excess excavation material that cannot be used as backfill material will be sent to the licensed landfill of Yozgat Municipality by licensed vehicles. Details of dust emission calculations that will occur during the construction phase of the Project are given in Appendix- 4.

The following provisions are included in Annex-2 Article 1 and Annex-12 Article 2 of the IAPCR regarding the Project:

- "Calculation of the Air Pollution Contribution Value (APV) in the impact area of existing and new facilities to be established by using dispersion modeling, measurement of air quality in the impact area of the facility, and determination of measurement methods are conducted according to the following principles:
  (a) The hourly mass flow rates of the emissions given to the atmosphere from the facilities are determined by measuring from the stacks for existing facilities and by using emission factors for non-stack sources and new facilities to be established.
  (b) If the hourly mass flow rate (kg/hour) values exceed the values given in Table 2.1, the APV of the emissions in the plant impact area is calculated hourly if possible, otherwise daily, monthly and annually."
- "If the measures specified in Annex-1 (Watering, Use of closed transport systems, Keeping the material moist, Loading and Unloading without skidding, etc.) are taken during excavation, loading, transportation, unloading, and storage operations. In that case, the mass flow rate of dust emission from these operations should be calculated using the controlled emission factors in Table 12.6."

During the construction works, the total amount of dust emission –under controlled conditions- as a result of the excavation, loading, and transportation of soil is calculated as **0.8379 kg/hour** and is below 1 kg/hour, which is the value of dust emission from non-stack sources specified in Table 2.1 of the IAPCR.

Moreover, as mentioned previously, calculations have been performed as if the whole pipeline route will be excavated. However, the dust emission will be less than the calculated during the construction phase.

As a result, low amounts of dust emissions are likely to occur in the short-term during construction phase activities. Therefore, the impact of dust emissions on construction workers and sensitive receptors in the Project Area should be minimized. It is assumed that dust emissions will be at a controlled level with the measures that can be taken for project air emissions in Chapter 8. The total channel length planned for the project will not be completed within the same time interval but at different time intervals in accordance with the work schedule. Therefore, the calculated total amount of dust emission is expected to be less in practice.

Gas emissions will occur due to the operation of construction machinery and vehicles during the project's construction phase. Within the scope of the project, it is assumed that the quantity of diesel fuel consumed by the construction vehicles used on the construction will be between 6 and 10 liters per hour on average, and it is assumed that working time will be 10 hours per day and 300 days per year. Since the companies that will undertake the construction works for the project have not yet been determined, information about the vehicles and work machines that can be used during the construction phase was provided by DSI experts. It has been calculated that a total of 64.22 kg/h of diesel will be used in the vehicles to be used within the scope of the construction activities. Details of exhaust gas emission calculations that will occur during the construction phase of the Project are given in Appendix-4.

Air emissions from the construction phase of the Project were analyzed in accordance with the Regulation on Industrial Air Pollution Control within the scope of national legislation and WBG's EHS Guidelines Air Emissions and Ambient Air Quality document within the scope of international standards and the one with the most stringent limit value was selected as the Project Standard. Accordingly, the amount of air emissions from the construction phase of the Project is given in Table 7-7, and compared with the Project Standards.

Table 7-7. Comparison of Air Emissions from Construction Phase with Project Standards[57]

Activity Source	Pollutant Parameter	Unit	Total Emission	Project Standards
Construction Vehicle Usage	Dust (Uncontrolled)*	kg/h	1.6759	1
	Dust (Controlled)	kg/h	0.8379	1
Exhaust Gas Emissions	NO_X	kg/h	0.0017	4
	CO	kg/h	0.0053	50
	PM	kg/h	0.0273	1
	SO_2	kg/h	5.746	6
	VOC	kg/h	0.017	3
*Comparison of this emission value with the project standard should not be considered as Project construction activities will be conducted under controlled conditions.				

Calculations are made assuming that vehicles and work machines will work at the same time. However, vehicles and construction machines will be used at different times and in different work areas during the day. Therefore, the calculated pollutant emissions will be much less. The concentration values of the pollutants that will be caused by the construction equipment to be used are below the project standards and, therefore, are not expected to have a negative impact on the existing air quality of the region.

Emission quantities and characteristics have been calculated for F-1 Permeable Material Quarry and K-1 Rock Material Quarry in the Project Introduction File. Accordingly, the mass gas emission flow rates that will be released in these quarries were compared with the limit values given in Annex-2 Table 2.1 of the IAPCR. The mass gas emission flow rates that will occur in these quarries are below the limit values.

In addition, dust emissions have also been calculated for the quarries. Accordingly, the mass dust flow rate calculated for F-1 Permeable Material Quarry is below the limit value ("1 kg/hour") given in the IAPCR. However, since the mass dust flow rate calculated for K-1

[57] Formed by comparing calculations results with the Project standards (Turkish Air Quality Control Regulation and IFC/WBG EHS Guidelines limit values)

Rock Material Quarry is above this limit value, the Contribution Value to Air Pollution was calculated using the Gaussian Dispersion model. When the settled dust distribution obtained as a result of the dust modeling is examined, it is seen that the amount of dust settled in all directions falls below the limit value of 450 µg/m^{2}day.

While the gas emission values calculated in the Project Introduction File for the Limestone Material Quarry are below the limit values of IAPCR, the dust emission values are above the limit value of 1 kg/hour. Therefore, air quality dispersion modeling was performed for dust emission. The modeling results were compared with the limit values given in the Air Quality Assessment and Management Regulation and it was seen that the limit values were met.

Details of the calculations are provided in Appendix-4. Section 8 provides mitigation measures for the prevention of dust pollution.

7.2.5.2 Operation Phase

The project area is a rural area and there are no significant emission sources such as industrial activities other than agricultural activities. No excavation activities will be conducted during the operation phase of the Project. There will be no use of vehicles / construction equipment for the operation phase. Dust emissions would occur due to maintenance and repair activities. However, these maintenance and repair activities will not be comprehensive, and long-term. So, it is not expected that the possible dust emission will affect the existing air quality significantly. Nevertheless, mitigation measures provided in Section 8 will be followed to prevent any dust related grievences.

7.2.6 Noise Generation

7.2.6.1 Construction Phase

Within the scope of the project, ladles, trucks, and pumps are planned to be used in construction activities. The number and sound power levels of the vehicles and construction machines to be used are given in Table 7-8.

Table 7-8. Number and Sound Power Levels of Machinery and Equipment to be Used in the Construction[58]

Machinery Equipment Name	Number	Sound Power Level (dBA)
Excavator	2	99
Truck	3	99
JBC	1	104
Grader	1	104
Cylinder	1	99

Noise levels of noise that will occur in the field and possible noise sources; Regulation on Noise Emissions in the Environment Created by Equipment Used in Open Areas, which was prepared by the Ministry of Industry and Trade and entered into force by being published in the Official Gazette dated 30.12.2006 and numbered 26392 and published with its amendment in the Official Gazette dated 06.06.2017 and numbered 30088. Accordingly, noise level calculation results for the Project construction phase are given in Appendix-4 and noise level changes according to distances are given in Figure 7-5.

[58] It has been benefited from the embedded dataset of Sound Plan software, 2024

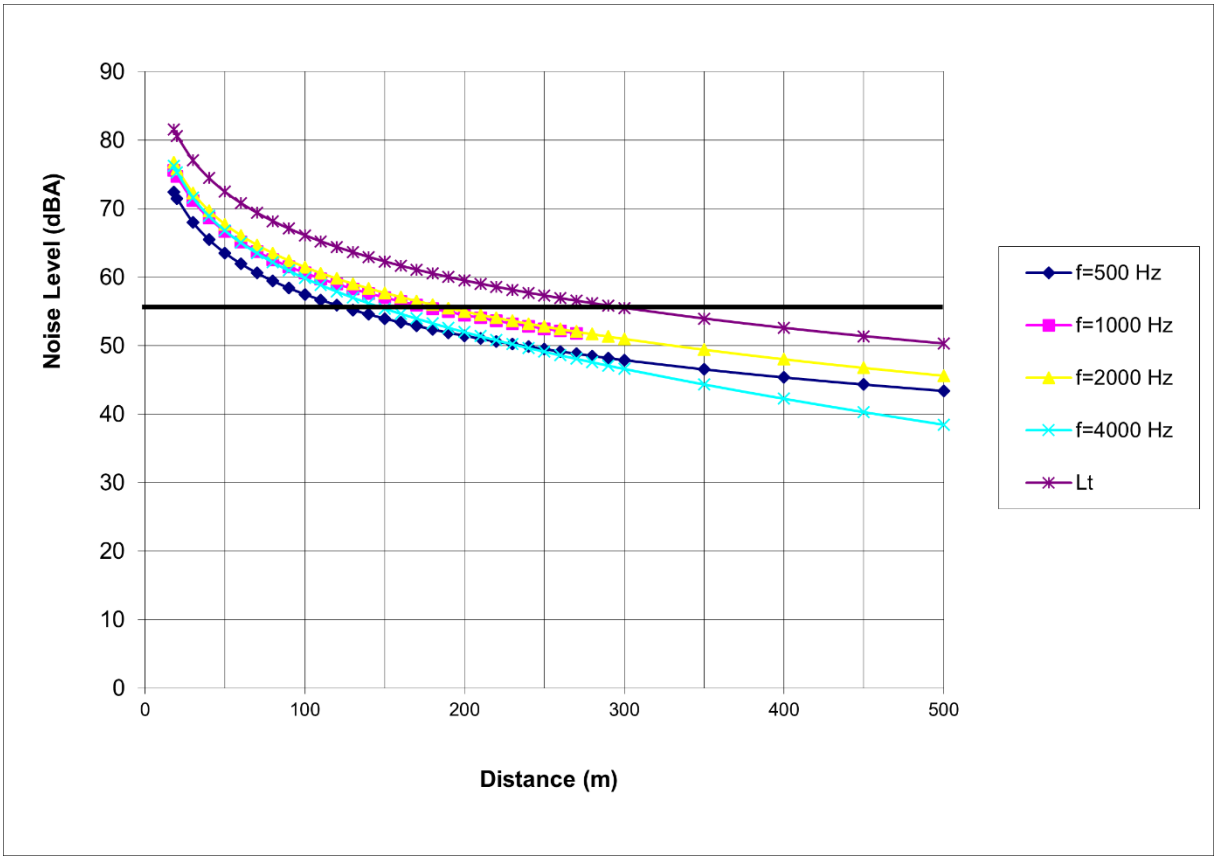

Figure 7-5. Noise Level According to Distances for Construction Phase[59]

Table 7-9. Construction Phase Noise Level and Project Standards[60]

Sensitive Area	Project Area Distance to the Nearest Sensitive Area (m)	Calculated Lt (dBA)	Project Standards (dBA)
H-6	18	81,56	55
-	20	80,63	
-	30	77,03	
-	40	74,46	
H-4	50	72,46	
-	60	70,80	
-	70	69,40	
-	80	68,17	
H-5	90	67,08	
-	100	66,10	
-	110	65,21	
-	120	64,39	
H-3 H-12 H-15	130	63,64	

[59] Calculations have been made according to formulations in T.R. Ministry of Environment and Urbanization, General Directorate of EIA Permit and Audit, Principles for Preparation of EIA Reports and Project Introduction Files within the Scope of the Regulation on Assessment and Management of Environmental Noise, 2018, and graphic has been created accordingly.
[60] The comparison between the calculation results and the Project Standards are summarized.

Sensitive Area	Project Area Distance to the Nearest Sensitive Area (m)	Calculated Lt (dBA)	Project Standards (dBA)
-	140	62,93	
-	150	62,28	
-	160	61,66	
-	170	61,07	
H-13	180	60,52	
-	190	60,00	
H-1	200	59,50	
-	210	59,02	
-	220	58,57	
H-2 H-16	230	58,13	
E	240	57,71	
-	250	57,31	
-	260	56,92	
H-7 H-11	270	56,54	
M-4	280	56,18	
H-10 H-14 H-17	290	55,83	
M-2 H-8	300	55,49	
-	350	53,93	
-	400	52,57	
-	450	51,37	
-	500	50,28	

Table 7-9 shows that the noise levels caused by the construction equipment to be used during the construction phase meet the project standards for 350 meters. It should be noted that the project construction activities will be conducted step-by-step and short-term at different time intervals by selecting small areas. However, in case of complaints from sensitive receptors, the construction works will be stopped, and noise level measurements will be conducted by an accredited laboratory.

In the Project Introduction Files of the permeable material, rock and limestone quarries, noise level calculations have been performed. Those details are given in Appendix-4 as well. Moreover, the air pressure resulting from the blasting to be carried out within the scope of the limestone quarry is 118.33 dB, which does not exceed the 133 dB limit value at frequencies lower than 2 Hz specified in the US Federal Regulations.

Vibration from Blasting in K-1 Rock Material Quarry

In the Project Introduction File for material quarries, vibration calculation has been made for the blasting to be carried out in the rock quarry.

If it is accepted that the most sensitive structures in the vicinity are “type b” buildings (plastered briquette, adobe, masonry brick houses), the vibration velocity should not exceed 5 mm/sec. When the calculations of vibration velocity values according to distance are examined, the vibration velocity generated by the effect of 39.5 kg charge decreases below 5 mm/sec after 200 m from the blasting point. In this case, it is seen that the vibration caused by blasting with instantaneous charge will not have a negative impact on the settlements closest to the blasting area.

Vibration from Blasting in Limestone Quarry

In the Project Introduction File for limestone quarry, vibration calculation has been made for the blasting to be carried out.

Instantaneously (per delay) 41.63 kg of explosives are used and the closest sensitive building to the blasting point is the house in Kösrelik Village, located approximately 935 m northeast of the quarry as air distance. Since the national regulation stipulates that a vibration velocity of 5 mm/s should not be exceeded for waves with a frequency of 1 Hz and the calculated vibration velocity (0.127 mm/s) value is lower than the value allowed by the regulation, it will not cause threshold level damage to the nearest sensitive structure.

The mitigation measures given in Chapter 8 will be followed in these areas. These impacts can be managed by general measures regarding construction activities (appropriate regulation of working hours regarding noisy activities, providing necessary information to surrounding residences, use of necessary personal protective equipment by personnel, etc.). During construction, possible public complaints will be managed through the Grievance Mechanism.

7.2.6.2 Operation Phase

The project area is a rural area and there are no significant noise sources such as industrial activities other than agricultural activities. There will be no continuous noise generation during the operation phase of the Project. Only the machinery and equipment to be used during the maintenance activities will cause noise generation but those activities will be performed in a short period of time since the activities only include the repair works, if any damage is detected. The project area is a rural area and there are no significant noise sources such as industrial activities or traffic other than agricultural activities. Thus, noise generation for the operation phase is considered negligible. Mitigation measures provided in Section 8 will be followed to prevent any noise related grievences.

7.2.7 Natural Disaster Potential

7.2.7.1 Construction Phase

As discussed in Section 5.5, the risks of earthquakes, landslides, rock falls and avalanches in the region are determined as low. The most common type of disaster in the province is stated as floods and inundation.

Kösrelik Pond will be constructed in accordance with Flood and Sediment Control Regulation and Regulation on Buildings to be Built in Disaster Areas and Turkish Building Earthquake Regulation. The designs of the structures should be assessed in this regard before approval.

There is no flood risk since piping works will be carried out within the scope of the Project. Kösrelik Pond is being constructed on Özdere and in the Detailed Dam Safety Final Report, flood design flows were examined with several different methods. In the spillway design, the design flow rate was selected as 93.8 m^3/s based on a 10000-year recurrence period and the design flow rate was selected as 18.4 m^3/s based on a 25-year recurrence period. An Emergency Action Plan will be prepared by DSI for the construction of Kösrelik Pond. Emergency Action Plans including natural disaster risks (especially flood and inundation risks) will be prepared for material quarries and work will not start until the measures in these plans are taken.

7.2.7.2 Operation Phase

The structures will be constructed in accordance with the national regulations regarding the natural disasters (i.e. Flood and Sediment Control Regulation, Regulation on Buildings to be Built in Disaster Areas and Turkish Building Earthquake Regulation).

During the maintenance and repair works of the Project, the irrigation union will include additional measures in case of flooding risks.

The Kösrelik Pond has been designed by calculating the flood risk. Accordingly, the design flow rate was selected as 93.8 m^3/s based on a 10000-year recurrence period and the design flow rate was selected as 18.4 m^3/s based on a 25-year recurrence period. An Emergency Action Plan including flood and other types of natural disasters will be prepared by DSI for the operation phase of the Pond. Detailed conclusions regarding the dam safety of Kösrelik Pond have been made as a result of the Dam Safety Report (see Appendix-8), but it is not possible to present all of them in this ESMP. Within the scope of the Project, all issues in the Dam Safety Report will be complied with and the measures specified in the report will be taken. Moreover, within the scope of TULIP, the Dam Safety Report of Kösrelik Pond has been reviewed by an independent Dam Safety Expert (DSE). Accordingly, some gaps and deficits which impact on the dam safety have been idenfied and recommendations to improve the dam construction and management have been provided. The DSI should follow these recommendations with particular attention to the following:

- The DSE found significant gaps in material testing and design have been identified, particularly regarding the inadequate laboratory testing of critical fill materials, including rock and sand filters, as well as the bedrock. This shortfall results in an absence of verified physical and strength parameters essential for ensuring the dam's stability. Furthermore, the lack of specific design criteria for the geosynthetic materials on the upstream face is a concern, as it is vital to confirm their suitability. To address these issues, it is recommended that the additional tests outlined in Tables 5.14 and 5.20 of the Dam Safety Assessment Report be conducted without delay.The DSE has also identified structural and equipment deficiencies at the site, including a damaged plinth, likely a consequence of soil stability issues, and malfunctioning or absent monitoring instruments such as extensometers and inclinometers. The report emphasizes the urgency of repairing the plinth, replacing unsuitable fill materials, and equipping the site with the necessary instruments. It also recommends addressing slope stability around the penstock by reducing the slope ratio to less than 1:2 and implementing protective measures in vulnerable areas near the spillway where rock and soil falls have been observed. The DSI is advised to promptly implement these recommendations to enhance the construction quality and ensure the operational safety of the dam.
- There is no operation and maintenance manual/procedures for the dam. For this dam, an Operation and Maintenance Plan (O&MP) should be prepared to guide the dam operation, maintenance and surveillance. The DSI should prepare and implement the O&MP to practice proper dam operation and maintenance and surveillance and ensure the safety operation of the dam. The plan should be prepared and finalized 6 months prior to the first filling of the reservoir.
- There is no written Emergency Preparedness Plan (EPP) for Kösrelik Pond. In the event of dam failure or improper operation, the inhabitants of these villages and their agricultural lands would be significantly impacted. The DSI is strongly recommended to prepare and finalize the EPP one year prior to the initial filling of the reservoir. The EPP should include strategies for immediate response, evacuation procedures, communication plans, and recovery efforts to minimize the potential damage and ensure the well-being of the affected communities.

7.2.8 Biodiversity and Natural Protected Areas

There are no legally protected areas or Key Biodiversity Areas (KBAs) within the project area and its vicinity. Therefore, there is no trigger regarding habitat. No endemic species have been identified among the species recorded. However, due to restricted movement, protection measures are necessary for *Testudo graeca* (Tortoise) among the identified species, and since the project area primarily consists of agricultural lands, the European Turtle-Dove (*Streptopelia turtur)* is not considered a trigger species. Additionally, *Gypaetus barbatus, Falco vespertinus*, and *Spermophilus xanthoprymnus* are not present as trigger species in the project area since their habitats include rocky cliffs, tree-covered plains, and thorny shrublands.

7.2.8.1 Construction Phase

During the construction phase, any encountered *Testudo graeca* species should be relocated to alternative areas. Within this scope, the species will be left in a manner that allows them to return to the project area afterward. Care will be taken and handled sensitively towards the species during the construction work.

Construction activities can disrupt the natural habitats of birds, particularly those that rely on the stream beds and nearby vegetation for nesting and feeding. Noise and human presence can lead to stress and displacement, affecting breeding success and leading to potential abandonment of nests.

The construction activities will be scheduled outside the breeding season, when possible, to minimize disturbance to nesting birds. Construction plans will be designed to minimize alteration of the stream bed and maintain natural flow patterns as much as possible. Erosion and sediment control measures, such as silt fences and sediment traps, will be implemented to prevent runoff from contaminating the stream. Stringent erosion and sediment control measures will be implemented to minimize possible turbidity and sedimentation in the stream bed. Spill prevention and response will be implemented to quickly address any chemical spills or leaks, minimizing the risk of contamination. After construction, disturbed areas will be restored by replanting native vegetation and enhancing habitats to support bird populations. Workers will be trained on the importance of minimizing disturbance to wildlife.

In Kösrelik Pond, during field studies conducted on February 14 and August 13, the water flow was at a minimal level. As long as the provided measures are followed, no issues are expected in the future. The project area surroundings comprise agricultural lands subject to periodic irrigation. The flora and fauna species identified within the project scope are typically prevalent throughout the country and are not anticipated to face endangerment in the foreseeable future. Consequently, adverse effects on the flora and fauna within the area due to the project are not anticipated.

7.2.8.2 Operation Phase

No impact on the biological environment is expected during the operation phase. However, similarly with the construction phase, care should be taken and handled sensitively towards the *Testudo graeca* species during the maintenance and repair works.

7.2.9 Use of Pesticides

Strict inspections are implemented in Türkiye to prevent pesticide use, and the authority for inspections lies with the Ministry of Agriculture and Forestry.

Even the Project does not directly include the use of fertilizers and pesticides, any increase in the production of agricultural crops as an outcome of the Project may be likely to increase the pest incidence and use of pesticides or agrochemicals and thus, pest control measures may be necessary for the project. Appendix-7 is an example of a generic Pesticide Management Plan. DSI will follow the guidelines in this Appendix as applicable and provide

training to farmers for proper use of fertilizers, pest and disease management in line with this Appendix. DSI will encourage the use of bio-pesticides and aim to minimize the use of chemical pesticides when possible.

7.3 Social Risks and Impacts

7.3.1 Land Acquisition

7.3.1.1 Construction Phase

Under the project, expropriation activities will be carried out in the lands of Kösrelik Village in Aydıncık District, Yozgat Province, and Körpınar Village in Aydıncık District, Çorum Province. These activities will be conducted in accordance with Article 10 of the Expropriation Law. The land acquisition will be carried out through proporty expropriation.

In Kösrelik Village, two parcels will be affected. Both parcels are privately owned, The total number of landowners for these parcels is five. The total land area that will be permanently affected by expropriation in Kösrelik is 2,878.66 m².

In Körpınar Village, a total of 46 parcels will be affected, all of which are privately owned. The total number of landowners for these parcels is 54. The total land area that will be permanently affected by expropriation in Körpınar is 27,767.23 m².

The field survey for land acquisition was completed in the first week of February 2025 (01.02.2025-02.02.2025), and details of the studies will be provided in the Resettlement Plan.

As a summary, to avoid the economic and social impacts in areas planned for expropriation, responses have indicated preferences for acquiring new land, limiting the relevant activity, and prioritizing other economic activities. In this context, the expected social impact will be addressed through livelihood restoration measures and the payment of full replacement costs during the resettlement process.

Before the land acquisition process begins, the relevant Resettlement Plan will be approved and disclosed on the official website. Following this, a public consultation meeting will be held to ensure community participation. The plan will then be finalized and used as a guiding document for land acquisition activities.

According to this report, the contractor’s mobilization will not take place until the land acquisition processes are fully completed.

Within the scope of the Project, it is envisaged that a total of 20 personnel will work during the construction phase (irrigation project). Although definitive information regarding the number of personnel to be employed for Kösrelik Pond construction and the resulting need for worker camps has not yet been obtained, individuals who lose more than 10% of their total land assets will be classified as vulnerable groups under the livelihood restoration plan within the Resettlement Plan. Additional measures will be implemented to restore their livelihoods.

Among these measures, provisions will be made to include affected individuals in vocational training programs offered under projects within the TULIP framework. Another measure is that, even if they are not directly affected by land acquisition, locals will be given priority for employment opportunities in the projects to be implemented.

Camp site installation is planned to be conducted for the construction period of Kösrelik Pond. If any activity requires land acquisition for worker camps, these camps cannot be established until the land acquisition process is fully completed, as defined in the Resettlement Plan..

7.3.1.2 Operation Phase

There is no anticipated impact during operation phase due to the not envisaged need to land acquisition.

7.3.2 Population and Demography

7.3.2.1 Construction Phase

In meetings with mukhtars and other stakeholders, no construction activity affecting the population has been mentioned.

Under the project, expropriation activities will be carried out in the lands of Kösrelik Village in Aydıncık District, Yozgat Province, and Körpınar Village in Aydıncık District, Çorum Province.

In Kösrelik Village, two parcels will be affected. Both parcels are privately owned. The total number of landowners for these parcels is five. In Körpınar Village, a total of 46 parcels will be affected, all of which are privately owned. The total number of landowners for these parcels is 54.

To avoid the economic and social impacts in areas planned for expropriation, responses have indicated preferences for acquiring new land, limiting the relevant activity, and prioritizing other economic activities. In this context, the expected social impact will be addressed through livelihood restoration measures and the payment of full replacement costs during the resettlement process.

Within the scope of the Project, it is envisaged that a total of 20 personnel will work during the construction phase (irrigation project). Although definitive information regarding the number of personnel to be employed for Kösrelik Pond construction and the resulting need for worker camps has not yet been obtained, individuals who lose more than 10% of their total land assets will be classified as vulnerable groups under the livelihood restoration plan within the Resettlement Plan. Additional measures will be implemented to restore their livelihoods.

Among these measures, provisions will be made to include affected individuals in vocational training programs offered under projects within the TULIP framework. Another measure is that, even if they are not directly affected by land acquisition, locals will be given priority for employment opportunities in the projects to be implemented.

Camp site installation is planned to be conducted for the construction period of Kösrelik Pond. If any activity requires land acquisition for worker camps, these camps cannot be established until the land acquisition process is fully completed, as defined in the Resettlement Plan.

7.3.2.2 Operation Phase

In Kösrelik Village, two parcels will be affected. Both parcels are privately owned. The total number of landowners for these parcels is five. In Körpınar Village, a total of 46 parcels will be affected, all of which are privately owned. The total number of landowners for these parcels is 54.

As a result of the mitigation measures to be implemented during the pre-construction and construction phases, any adverse impacts that could lead to population change will be eliminated. Therefore, no impact is expected to extend into the operation phase that could positively or negatively affect the population structure.

7.3.3 Livelihood and Employment

7.3.3.1 Construction Phase

The findings from the meetings indicate concerns that crops might be damaged due to dust and excavation activities. These concerns can be mitigated through recommended watering practices on the roads during land works. In this context, the impact of the construction period could be observed as a loss of yield, leading to a decrease in agricultural income due to potential crop damage. A similar situation applies to grazing areas as well. The seasonal workers will probably meet income loss due to the temporarily vacant lands caused by construction activities.

The projected number of workers has been set at 20, but the exact figure will also be finalized only after the Contractor/s selection. Therefore, the impact on local employment cannot be fully anticipated.

7.3.3.2 Operation Phase

Meetings with mukhtars and other stakeholders have revealed findings that the irrigation project is expected to increase both crop yield and cropping patterns. In this context, the project is anticipated to have positive effects on agricultural income for farmers during the operational period.

There is an expected employment for 5 workers. This condition can be observed as minor / temporary local employment opportunities.

7.3.4 Labor Influx

7.3.4.1 Construction Phase

The villages of Mercimekören, Körpınar, and Kocabekir, where unemployment is an issue, could be involved in providing the necessary workforce. Although there is no mention of a youth unemployment problem in Kösrelik, the fact that half of this village's population consists of young people suggests that the region could also benefit from employment opportunities.

Within the scope of the Project, it is envisaged that a total of 20 personnel will work during the construction phase (irrigation project). Definitive information regarding the number of personnel to be employed and the resulting need for worker camps has not yet been obtained for Kösrelik Pond construction.

Individuals who lose more than 10% of their total land assets will be classified as vulnerable groups under the livelihood restoration plan within the Resettlement Plan. Additional measures will be implemented to restore their livelihoods.

Among these measures, provisions will be made to include affected individuals in vocational training programs offered under projects within the TULIP framework. Another measure is that, even if they are not directly affected by land acquisition, locals will be given priority for employment opportunities in the projects to be implemented.

7.3.4.2 Operation Phase

There is an expected employment for 5 workers. This condition can not be observed as labor influx.

7.3.5 Disadvantaged / Vulnerable Individuals or Groups

7.3.5.1 Construction Phase

Seasonal agricultural workers, the elderly, and people with disabilities are expected to be more significantly affected by dust and noise during the construction period. Road usage restrictions could also place the elderly and people with disabilities in a more vulnerable situation. During the process of announcing the project's environmental and social impacts,

minorities who do not speak Turkish, the elderly, and women heading households alone might be in a sensitive position due to the risk of being excluded from participation processes. Similarly, seasonal agricultural workers could also be excluded from notification processes, leading to their potential exclusion from participation activities. The inadequate accommodation conditions and the temporary nature of their stay make seasonal agricultural workers' situations particularly critical. Therefore, seasonal agricultural workers should be among the primary groups receiving significant attention during the construction period.

For detailed information please refer to Section Disadvantaged / Vulnerable Individuals or Groups (DVIG). Additional information on the public participation process for disadvantaged or vulnerable groups are given in detail Project's specific SEP (CNR-PLN-TULIP-KSR-SEP-001).

7.3.5.2 Operation Phase

There is no expected impact on vulnerable groups during operation phase.

7.3.6 Labor and Working Conditions

Within the scope of the Project, it is envisaged that a total of 20 personnel will work during the construction phase (irrigation project). Definitive information regarding the number of personnel to be employed and the resulting need for worker camps has not yet been obtained for Kösrelik Pond construction.

Individuals who lose more than 10% of their total land assets will be classified as vulnerable groups under the livelihood restoration plan within the Resettlement Plan. Additional measures will be implemented to restore their livelihoods.

Among these measures, provisions will be made to include affected individuals in vocational training programs offered under projects within the TULIP framework. Another measure is that, even if they are not directly affected by land acquisition, locals will be given priority for employment opportunities in the projects to be implemented.

Camp site installation is planned to be conducted for the construction period. If any activity requires land acquisition for worker camps, these camps cannot be established until the land acquisition process is fully completed, as defined in the Resettlement Plan.

If accommodation at a camp site, especially for the construction phase, will be provided for the workers, which will be finalized after the Contractor/s selection. A Camp Site Management Plan or a Worker Accommodation Plan will be prepared and implemented by the Contractor in line with Contractor's LM Plan and Project's LMP.

For labor and working conditions, the risks and impacts are related to child labor, forced labor, unregistered employment, lack of occupational health and safety measures, discrimination, lack of worker grievance mechanism, lack of social facilities to workers, etc. To eliminate those risks, the Contractors (including Maintenance/Repair Contractor for the operation phase) and the Project Owner should provide the following:

- Strictly adhering to international standards by prohibiting child labor and forced labor.
- Depending on voluntary employment relationships to preserve the dignity of the workforce.
- Advocating equal opportunities and fair treatment in the workplace, eliminating discrimination and harassment based on factors such as language, race, sex, political opinion, philosophical belief, and religion in labor relations.
- Recognizing the right to freedom of association without fear of reprisal and uphold the right of workers to engage in collective bargaining.
- Scrutinizing working hours to prevent exploitation and establishing minimum wage levels to ensure a decent standard of living.

- Ensuring full compliance with ethical labor practices for a socially responsible work environment.
- Implementing the right to collective bargaining in accordance with Law No. 6356 on Trade Unions and 4857 Labour Law on Collective Bargaining.
- Guaranteeing an efficient Project grievance mechanism to address concerns.
- Providing workers with detailed written contracts encompassing job descriptions, working hours, rights and responsibilities, a code of conduct, and information about the workers' grievance mechanism.
- Minimizing potential impacts on surrounding neighborhoods by offering amenities within the Project Area aligned with the employees' needs.
- Implementing a Human Resources Policy compliant with the European Convention on Human Rights, the Turkish Constitution and International Labor Organization (ILO) provisions.
- Providing all workers with the necessary trainings including basic and technical OHS, worker rights and responsibilities, environmental and social orientation trainings, emergency trainings, etc.

The Contractor (and the Maintenance/Repair Contractor during the operation phase) will develop its own Labor Management (LM) Plan based on TULIP's Labor Management Procedure (LMP)[61]. This plan encompasses various provisions, including the assurance that workers will be provided with written contracts detailing job descriptions, working hours, wages, rights and duties descriptions, and a Code of Conduct (CoC), among other aspects. Additionally, the prepared LM Plan will ensure that these measures will also be followed by the third parties.

The Project impacts on labor and working conditions are generally assessed as adverse but low in significance. The Project's limited personnel requirement makes the impacts on these issues easy to manage. By following the provisions given in LMP, as well as the provisions of the related Turkish national law and regulations, the workforce will be protected from possible adverse labor and working condition impacts/risks.

Since the project activities will be performed in the village center close to the local community, Gender Based Violence (GBV) and Sexual Exploitation and Abuse / Sexual Harassment (SEA/SH) may be a risk for the project. To minimize the GBV and SEA/SH related risks within the scope of the Project, the following mitigation measures will be taken by the DSI and the Contractor:

- Awareness raising activities such as training regarding GBV and SEA/SH will be provided to all Project workers.
- All Project workers will sign and be informed about the Code of Conduct (including GBV and SEA/SH provisions).
- A functional GM both for workers and the local community will be established and implemented to capture GBV and SEA/SH related complaints.
- Separate social facilities (such as toilets, resting areas, etc.) for men and women will be provided.

OHS risks and impacts will be managed and mitigated by OHS Management Plan and Risk Assessment (including Emergency Response Plans) to be prepared by the Contractor before construction activities start. The details regarding OHS impacts and risks are given in the following section.

[61] Available at https://www.ogm.gov.tr/tulip/cevresel-sosyal-yonetim-cercevesi/is-gucu-yonetim-proseduru

7.3.7 Occupational Health and Safety

In areas where there is a difference in elevation or a possibility of injury due to a fall, the working area should be surrounded by sturdy barriers consisting of intermediate and upper guardrails to prevent falls. In crowded public places, this process should be carried out without considering depth. Brightly colored barriers and various signs are used for better visibility, and in cases where signs are insufficient, markers can also be placed.

Work will be carried out in accordance with the relevant regulations given in Appendix-3. The sections of 2.0 OHS, 3.0 Community Health and Safety and 4.0 Construction and Decommissioning of the WBG General EHS Guidelines (2007) are also applicable for the project.

Before commencing the construction, an Occupational Health and Safety Management Plan (OHSMP) will be prepared by the Contractor[62]. The OHSMP should take into account national and international practices and encompass all necessary instructions. This Plan is a document prepared or ensured to be prepared by the responsible employer, project supervisor or project coordinator for the entire construction site to coordinate health and safety matters among different employers, subcontractors, self-employed individuals, and various work teams operating in the same construction area. It defines the assessment of potential risks and determines when and by whom health and safety measures, organizational structure, work methods, and related tasks should be implemented throughout the construction process.

The Contractor is responsible for identifying and controlling hazards in every area, from the preparation phase of the work to the delivery phase, in all areas where the workers are involved including the camp site. Additionally, mitigation measures for the pre-construction are given in Table 8-1.

7.3.7.1 Construction Phase

To ensure the monitoring and sustainability of health and safety issues during construction, it is necessary to establish an Occupational Health and Safety (OHS) unit. This team will consist of an occupational physician conducting periodic health examinations for the employees working during the construction phase, assistant health personnel to support them, and an OHS Expert. The construction phase of the project falls into the 'very hazardous' category in the Workplace Hazard Classes Notification on OHS (Official Gazette number 28509 dated 26.12.2012).

According to the Regulations on the Duties, Authorities, Responsibilities, and Training of Occupational Health Physicians and Assistant Health Personnel, the project owner, contractor, and subcontractor must provide occupational health physicians and assistant health personnel within the specified periods required by the regulation. Additionally, the Project Owner is obliged to have one (1) full-time OHS Expert, Class A, while the contractor and subcontractor must have one (1) OHS Expert of either Class A or Class B.

A Risk Assessment will be conducted to identify existing or potential hazards within the workplace, both internal and external, analyze and rank risks arising from these hazards by considering factors leading to their occurrence, and determine control measures.

Risk assessment is conducted by a team formed by the Contractor. The risk assessment team consists of the following:

[62] **Source:** 05.10.2103 dated 28786 numbered Regulation on Occupational Health and Safety in Construction Works" Article-8

- Employer or employer's representative.
- Occupational safety specialists and occupational physicians providing health and safety services at the workplace.
- Employee representatives at the workplace.
- Employees designated to represent all units at the workplace and who possess knowledge about ongoing activities, existing or potential hazards, and risks within the workplace.

The completion of a risk assessment does not exempt the employer from the obligation to ensure occupational health and safety in the workplace. Furthermore, the employer provides the individuals tasked with risk assessment with any necessary information and documents related to risk assessment.

The Emergency Preparedness and Response Plan (EPRP) will be prepared by the Contractor following stages starting from the design or establishment phase for all workplaces by the Contractor. These stages include identifying emergencies, taking preventive, and limiting measures against their adverse effects, determining designated individuals, establishing emergency intervention and evacuation methods, documentation, conducting drills, and renewing of the emergency plan.

Additionally, a project-specific Emergency Action Plan (EAP) will be developed, and drills will be scheduled. Possible emergencies in the workplace are determined based on the results of risk assessments, taking into account the following and similar aspects:

- Probability of fire and explosion.
- Probability of dissemination, poisoning, and outbreak of diseases caused by hazardous chemicals, biological, radioactive, and nuclear materials.
- Probability of natural disasters occurring.
- Probability of sabotage, war, terrorism, etc.
- Probability of an occupational accident.

OHSMP, EPRP (or EAP) and Risk Assessment Report will be prepared in accordance with the relevant regulations and include COVID-19 and other contagious diseases precautions, as well as the community health and safety-related risks and precautions.

7.3.7.1.1 Working at height

Since the excavation areas are planned to be approximately 1.5 m wide and 2-2.5 m deep, there is a risk of falling from a height or cave-ins. When working in areas with differences in elevation, there is a risk of falling. Therefore, this situation can be considered as working at height. Solid barriers should be erected around the excavation site during excavation work. Workers must wear Personal Protective Equipment (PPE), including reflective fluorescent vests, safety shoes, helmets, and goggles during excavation. The use of dust masks and ear protection will be mandatory as needed for potential dust and noise generated during excavation.

7.3.7.1.2 Working with chemicals

Chemical hazards denote the potential for sickness or injury arising from either a single acute exposure or repeated chronic exposure to substances that are toxic, corrosive, sensitizing, or oxidative. There is also a risk of uncontrolled reactions, such as fire and explosion, if incompatible chemicals are unintentionally mixed. The most effective prevention of chemical hazards involves a hierarchical approach encompassing the following strategies:

- Substituting the hazardous substance with a less harmful alternative.
- Implementing engineering and administrative controls to prevent or minimize the release of hazardous substances into the work environment, thereby maintaining exposure levels below internationally established limits.

- Minimizing the number of employees exposed or likely to be exposed.

During the construction phase, the use of chemical substances is not of a concerning magnitude. However, in cases where working with chemical substances is necessary:

The OHS Unit will conduct assessments related to the chemicals used, and hazard cards will be created. These hazard cards, along with Material Safety Data Sheet (MSDS) and, will be posted at accessible points in areas where chemicals are stored and used. Personnel working with chemicals will be provided with suitable equipment and PPE in accordance with the working conditions and the chemicals, and the procurement and stock process will be overseen by the respective departments.

7.3.7.1.3 Fire and explosion

The possibility of fire and explosion exists, albeit low, in the event of damage to electrical cables, water pipes, gas pipes, telephone lines, and sewage lines in the excavated areas.

7.3.7.1.4 Natural disaster potential

As discussed in Section 7.2.7, there is a natural disaster risk in the Project area although its possibility is low. Those natural disaster risks should be considered by the Contractor during the preparation of the Risk Assessment Report and EPRP, and additional mitigation measures should be taken accordingly. Moreover, the Kösrelik Pond will be constructed in accordance with the flood calculations. The necessary Risk assessments and Emergency Preparedness Plan will be prepared for the construction and operation phase of Kösrelik Pond and material quarries.

7.3.7.1.5 Noise

During the construction phase, the source of noise is the work equipment. The contractor should consider the noise emission characteristics of equipment when selecting equipment for the project and select the least noisy machine available to perform the specific work. Employees should be provided with ear protection to prevent them from being harmed by the noise.

Every employee who will work in areas with a noise level of 80 dB(A) or higher should receive training before starting work. This training should cover the potential effects of noise on hearing, the purpose of ear protectors, their advantages and disadvantages, proper usage, determining the appropriate type of protection, maintenance, and cleaning. Hearing protectors should be distributed to employees. These training sessions should be renewed annually. Additionally, regular annual examinations and audiometric tests should be conducted for employees before and after employment to monitor potential hearing damage.

Exposure action values and exposure limit values to be complied with throughout the construction phase are provided below according to the relevant legislation[63].

Minimum exposure action values: 80 dB(A). When the ambient noise level reaches 80 dB(A), hearing protectors should be readily available.

Maximum exposure action values: 85 dB(A). The effect of ear protectors is not considered in exposure action values. When the ambient noise level reaches 85 dB(A), hearing protectors must be used.

[63] **Source:** 28.07.2013 dated 28721 numbered Regulation on Protection of Employees from Risks Related to Noise

Exposure limit values: 87 dB(A). When applying exposure limit values, the protective effect of the personal hearing protection devices used by employees is also taken into account when determining the employee's exposure.

7.3.7.1.6 Vibration

During the construction phase, the source of vibration is once again the work equipment. To prevent employees from being harmed by vibration, regular maintenance of the work equipment will be carried out. Additionally, working hours for employees will be organized.

Exposure action values and exposure limit values to be complied with throughout the construction phase are provided below according to the relevant legislation[64].

For hand-arm vibration:

- Daily exposure limit value for an eight-hour working period: 5 m/s².
- Daily exposure action value for an eight-hour working period: 2.5 m/s².

For whole-body vibration:

- Daily exposure limit value for an eight-hour working period: 1.15 m/s².
- Daily exposure action value for an eight-hour working period: 0.5 m/s².

To prevent or reduce exposure;

- Risks originating from exposure to mechanical vibration are eliminated or minimized at the source, considering the feasibility of combating risks with technical developments.
- Compliance with the principles of risk prevention specified in Law No. 6331 is observed for preventing or reducing exposure.
- In case it is determined that the exposure action values mentioned the employer creates and implements an action plan specifically aimed at minimizing exposure to mechanical vibration and the risks it may cause, considering the following aspects.
  - Choosing alternative working methods that reduce exposure to mechanical vibration.
  - Selecting ergonomically designed appropriate work equipment that generates the lowest possible level of vibration considering the performed task.
  - Providing auxiliary equipment such as seating that effectively reduces whole-body vibration exposure, handholds that reduce transmitted vibration to the hand-arm system, and similar equipment to reduce exposure to vibration.
  - Implementing appropriate maintenance programs for the workplace, workplace systems, and work equipment.
  - Designing and arranging the workplace and working environment appropriately.
  - Providing necessary information and training to employees on using work equipment correctly and safely to reduce exposure to mechanical vibration.
  - Limiting the duration and level of exposure.
  - Regulating working hours with adequate rest periods.

7.3.7.1.7 Rotation and Moving Equipment

Injury or death can occur from unexpected starting of equipment or unapparent movements during operations, leading to entanglement, trapping, or impact on machine parts. Designing machines to eliminate trap hazards and preventing extremities from harm under normal operating conditions. Examples of proper design considerations include two-hand operated

[64] **Source:** 22.08.2013 dated 28743 numbered Regulation on Protection of Employees from Risks Related to Vibration

machines to prevent amputations, or the availability of emergency stops dedicated to the machine and strategically positioned.

If a machine or equipment has an exposed rotating part or an open pinch point that could jeopardize the safety of any worker, the machine or equipment should be equipped with a guard or another device that prevents access to the rotating part or pinch point. Guards should be designed and installed in accordance with appropriate machine safety standards.

The rotating components of machinery and lifting equipment used during material handling, as well as the rotating parts of hand tools that may be used during the assembly phase, can pose potential hazards. It is important to adhere to work instructions and prioritize the use of machine guards and PPE during these operations.

7.3.7.1.8 Mitigation Measures for Material Quarries

- During the operational phase of material quarries, compliance with the provisions of the “Regulation on Occupational Health and Safety in Mining Workplaces” published in the Official Gazette No. 28770 on 19.09. 2013, is mandatory.
- Operations must be planned with consideration of the risks associated with soil collapse or compaction. The slope and height of excavation surfaces and benches should be appropriate to the soil's composition, stability, and the working methods employed.
- Before each operation, necessary checks must be conducted to prevent soil and rock falls from higher slopes and excavation surfaces relative to the working area and transportation routes. Measurement activities should be carried out where necessary.
- Work on flat and sloped surfaces should be executed in a manner that does not compromise the soil's stability and balance.
- The strength of benches and transport routes must be suitable for the vehicles being used. These areas should be constructed to allow for the safe movement of vehicles and must be maintained regularly.
- In areas where heavy machinery is at risk of falling, such as dumping sites and benches, adequate safety barriers of sufficient height must be installed.
- Excavated areas, construction sites, nearby pathways used by workers, and transport routes must be continuously monitored for risks of mass and block movement or falling debris. No personnel other than those assigned to these tasks may work in these areas until hazards have been mitigated.
- Explosive materials and capsules suitable for the structure of the enterprises are used. No one other than the igniters are allowed to take and ignite explosive materials.
- During blasting operations, the matters specified in Regulation on Occupational Health and Safety in Mining Workplaces will be complied with.
- Guidelines for Open-Pit Operations: For workplaces where excavators and fillers are operated or deep drainage holes are implemented, guidelines must be prepared, considering relevant regulations and encompassing the details listed below. This guideline will include:

a) Maximum height of benches,

b) Bench dimensions and width that enable safe working conditions,

c) The slope angle required for benches, based on the characteristics of the work site, geological and tectonic structure, and physical properties,

d) The depth of drainage, spacing of drainage holes, and the distance between the bottom of the drainage hole and the face of the bench, along with the amount of explosives to be used based on these parameters,

e) Safety measures to be taken for personnel and machinery during detonation,

f) Working conditions for machinery, maneuvering areas, and safety measures for loading, transporting, and unloading operations,

g) Measures to prevent unauthorized entry into work areas,

h) Safety measures for the storage, transportation, and use of explosives.

Transportation of Explosive Materials[65]

The Ministry of National Defense has established National Mine Action Standards in the light of United Nations international standards. These standards will be followed during the transportation of explosives to the quarry.

The relevant standards recommend the application of the provisions of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) for transportation.

ADR can be accessed at:

http://www.unece.org/trans/danger/publi/adr/adr2013/13contentse.html

General Mitigation Measures and Key Points for Explosive Material Transportation

- The transport vehicle will be licensed under ADR.
- Every truck driver transporting dangerous goods must have a dangerous goods transportation certificate, the official name of which is “ADR Vocational Qualification Training Certificate”. This certificate is valid for five years and automatically expires if it is not extended before the expiry date. To extend the certificate, the driver must successfully pass a refresher course.
- Every company that regularly transports hazardous materials must have at least one hazardous materials advisor within the company. This person is responsible for compliance with the rules and regulations for the transportation of dangerous goods.
- Every truck carrying dangerous goods must have special equipment. This equipment must include retractable and foldable orange warning signs, a helmet and protective goggles, and two fire extinguishers.
- Necessary vehicle inspections will be carried out under ADR.

7.3.7.2 Operation Phase

The operation of the irrigation network will be performed by an irrigation union. Since the irrigation pipelines will be underground, no working at height risks is expected. Similarly, other significant OHS risks are not expected during the operation of the Project. However, the irrigation union should prepare and implement site specific OHSMP, EPRP and Risk Assessment Report for the operation of the irrigation network.

Moreover, Risk Assessments, Occupational Health and Safety Plan, Emergency Response Plan for operation phase of Kösrelik Pond will be prepared and implemented. Those documents will assess and mitigate the risks such as dam failure, water contamination, flooding, natural disasters, etc.

[65] https://www.msb.gov.tr/Content/Upload/Docs/mafam/MMFS/MMFS%2010.50.pdf
http://www.unece.org/trans/danger/publi/adr/adr2013/13contentse.html

7.3.8 Community Health, Safety and Security

7.3.8.1 Construction Phase

The activities which can affect the local community are improper waste and wastewater management; improper handling of chemical and hazardous materials; noise and dust emissions; health, safety and security risks due to construction activities to be held near the local community's premises; and traffic safety risks.

Improper waste and wastewater management may lead to health risks to the local community. Improper handling of waste can cause communicable diseases due to increased activation of microorganisms, and odor problems in the village. Similarly, improper wastewater collection or direct discharge may cause generation of microorganisms, and this wastewater can affect the soil and groundwater, causing a decrease in the soil and groundwater quality. Thus, this decrease in the soil quality may affect the quality or efficiency of the agricultural products.

Improper handling of chemical and hazardous materials such as storage of the chemicals on a permeable surface, storage of the chemicals in an open and accessible area, not taking emergency response measures (spill kits, fire extinguishers, and so on) etc. may cause health and safety risks both for the local community members and workers.

Where the construction activities will be performed close to the houses, noise levels and dust emissions is another health and safety issue. Even though the construction activities are short-term, with the necessary mitigation measures, the impact significance can be minimized to a minor level.

Unregistered access to the construction area by the local community members poses a health and safety risk for the members. Therefore, security arrangements such as hiring a security personnel, enclosing the construction area by fences or barriers can prevent those risks.

Traffic safety issues may arise due to the presence of the heavy construction machinery such as trucks, excavators, etc. To minimize this risk, the drivers/operators of that machinery will be trained, and the local community will be informed on the issue.

Detailed impact assessment on waste, wastewater, noise, air quality and traffic management are given under the relevant sections of this ESMP.

Dam Safety

Kösrelik Pond is an associated facility of the Project and it is under construction. The following actions will be taken to ensure dam safety in compliance with WB ESS4:

- When the dam safety assessment or remedial work recommendations are ready, DSİ will ensure that an effective dam safety program is in place and that full-level inspections and assessments will be conducted and documented to the satisfaction of the Bank.
- In case additional dam safety measures or remedial work are necessary, DSİ will ensure that the dam is designed and its construction is supervised by competent independent professionals.
- For high-hazard cases involving significant or complex remedial work, DSİ will employ a panel of independent experts to oversee the process.

General considerations of the Dam Safety Report (see Appendix-8) given by an independent DSE are given in Sectin 7.2.7.

7.3.8.2 Operation Phase

During the operation phase, no community health and safety risk is expected. On the other hand, the risks and impacts similar to the above-mentioned risks and impacts in the construction phase, may arise during the maintenance and repair works of the irrigation network. However, maintenance and repair works will be less comprehensive during a very limited period of time relative to the construction phase.

Moreover, necessary precautions should be taken for the Kösrelik Pond. The Pond should be made safe in accordance with the Dam Safety Report given in Appendix-8. Warning signs such as "GÖLETTE YÜZMEK YASAKTIR", "SULAMA SUYUDUR, KESİNLİKLE İÇİLMEZ" should be placed around the Pond. An EPP should be prepared for the operation phase of the Pond including the dam failuire, flood risks, water contamination, etc. Local communities should be informed about Dam Safety and the EPP.

7.3.9 Cultural Heritage and Chance Find

As has been discussed in the Section 6.5, there are no archaeologically protected areas and/or cultural assets which can be affected by the Project activities.

The only possible impact is encountering a chance find during the construction and operation phases given that the construction and excavation activities are conducted. Therefore, it is essential that both the construction Contractor and Maintenance/Repair Contractor use the prepared a Chance Find Procedure (CFP) and give related training to the personnel (see Appendix-5).

If any archaeological remains or objects are found, the construction activities will be stopped, and the Museum Directorate will be informed immediately pursuant to Article 4 of the Law No. 2863 as also elaborated in Appendix-5 of this ESMP.

It is not expected that no chance find will be encountered during the operation phase of the Project, if it occurs the CFP will be implemented by the irrigation union and/or Maintenance/Repair Contractor.

7.3.10 Traffic and Transportation

7.3.10.1 Construction Phase

In the current situation as discussed in Section 6.6, the traffic load near the project area is very low and generally restricted to the villagers (see Figure 6-3). It is anticipated that no significant additional load will be of concern, considering that limited number of vehicle given in Table 7-8, which is eight (8) in total, will enter the project area during the construction works to be carried out within the scope of the Project.

However, since the some of the construction areas are close to the residential areas in the villages, the traffic safety risk is of concern. The personnel operating vehicles and heavy equipment will be dedicatedly assigned, and they will be provided with traffic and road safety training. The maintenance of the construction machinery and equipment will be carried out regularly and regulatory speed limitations will be followed for construction vehicles, and this will be included in the construction site Traffic Management Plan (TMP) to be prepared by the Contractor. Additionally, the local community can be given an awareness session or brochures regarding the traffic and pedestrian safety. Alternative road passages should be identified for the local community, and those alternative road passages can be determined by the consultation with the mukhtar and/or local community members.

Particularly in near the construction areas close to the residential areas, the following precautions will be implemented:

- The movement of heavy machinery and materials will be scheduled during off-peak hours to reduce congestion and potential conflicts with regular traffic.

- The condition of roads used by construction vehicles will be regularly monitored and timely maintenance will be conducted to repair any damage caused by the increased traffic.
- Dedicated access routes will be established for construction vehicles that avoid residential areas.
- Strict speed limits for construction vehicles, particularly when passing through residential areas or near pedestrian crossings will be implemented.
- Traffic control personnel will be employed to manage vehicle movement during peak times and ensure safe passage for pedestrians.
- Clear and visible signage will be installed to inform the local community about construction activities.

Moreover, installing traffic-related signs, barriers and control devices will help to ensure the safety of the local community and the workers. Those should be provided by the Contractor at the project site before the construction activities begin.

According to the findings of the interviews with the mukhtar, it has been recommended to conduct watering on the roads to reduce the effects of dust from road usage. The mukhtars have stated that, with watering, road usage will be facilitated and the protection of crops along the roads and grazing areas can be ensured.

7.3.10.2 Operation Phase

During the operation phase of the project, there will not be any traffic or vehicle passage associated with the operation activities of the irrigation pipeline network. Only if a maintenance and repair works are deemed necessary, similar equipment and machinery will be used in the area. Therefore, the impacts regarding traffic safety will be similar to the construction phase, but the duration and context of the activities will be low, and therefore, the impact significance is determined as low.

8 ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES

As the Project Owner, the overall responsibility of the ESMP implementation, i.e., managing the environmental and social issues and ensuring necessary mitigation measures are taken, belongs to DSI. The ESMP will be implemented by the Contractor and subcontractors, under the supervision of DSI Regional PIU, TULIP PCU and DSI PIU.

Within the scope of the Project, there will be some environmental and social impacts and risks during the land preparation and construction and operation phases. Those impacts and risks will be minimized/mitigated by implementing the mitigation measures given in this chapter.

The summary of the impacts, assessment of significance and mitigation measures during preconstruction, construction and operation phases are given in the following sections.

The coding of the reference numbers of the overall environmental and social aspects of the impacts and risks are given as follows:

AQ	**:**	Air Quality
BC	**:**	Biodiversity Conservation and Natural Protected Areas
CH	**:**	Cultural Heritage and Chance Find
CHS	**:**	Community Health, Safety and Security (including traffic safety)
CP	**:**	Construction Phase
ES	**:**	Environmental and Social Management System
LA	**:**	Land Acquisition
LS	**:**	Land Use and Soil Quality
LWC	**:**	Labor and Working Conditions
MON	**:**	Monitoring
NM	**:**	Noise Generation and Management
NDP	**:**	Natural Disaster Potential
OHS	**:**	Occupational Health and Safety (including Emergency Response)
OP	**:**	Operation Phase
SOC	**:**	Social Issues (labor influx, livelihood, population, etc.)
SE	**:**	Stakeholder Engagement and Disclosure (including DVIG, GM, etc.)
PM	**:**	Pest Management
PR	**:**	Preconstruction
WM	**:**	Waste Management
WR	**:**	Water Resources and Use
WW	**:**	Wastewater Management

8.1 Mitigation Plan for Preconstruction Phase

This section presents potential impacts, cost effective and feasible mitigation measures to reduce adverse environmental and social impacts to acceptable level, identified impact significance before and after mitigation, cost of mitigation (if substantial) and responsible parties for the pre-construction phase. The preconstruction phase indicates the works and activities including preparation of plans and procedures, obtaining necessary permits/approvals, finalization of the designs, completion of land acquisition/expropriation processes, completion of procurement procedures, recruitment of personnel and completion of their trainings. The mitigation measures in addition to the standard mitigation measures listed above chapter(s) are presented in Table 8-1 for pre-construction phase.

Table 8-1. Environmental and Social Mitigation Plan for Preconstruction Phase

Mitigation Plan for Preconstruction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
PR-ES.01	Absence of an effective ESMS	Moderate	ESMP and other sub-management plans and procedures (Waste Management Plan, Labor Management Plan, Traffic Management Plan, Occupational Health and Safety Plan, Emergency Preparedness and Response Plan, Chance Find Procedure, etc.) will be prepared by the E&S Consultant and Contractor and approved by PIU. All management plans and procedures will be implemented throughout the Project lifetime. All management plans will be informed to all workers immediately after the recruitment and repeated if necessary. The approved ESMP will be added into the bid documents and required to be implemented by the Contractors. An ESMS and GM together with the control and monitoring mechanisms will be established and implemented. Necessary responsible personnel in PIU, Contractor and Regional Directorate of DSI will be assigned for tracking and monitoring of the ESMP implementation and compliance. The Contractor will employ at least a full-time OHS specialist, an environmental specialist, and a social specialist prior to the commencement of construction works. The Contractor will submit the CVs of specialists for approval. These specialists will be present at the site throughout the construction period. The Contractor will prepare and submit for approval (By PCU) and subsequently implement its Contractor ESMP (C-ESMP). The C-ESMP will be submitted prior to the commencement of construction works and no construction activities will be carried out under the Project until approval of the C-ESMP. The C-EMSP will include at least the following site-specific management plans: • Occupational Health and Safety Management Plan (OHSMP) including Risk Assessment and Emergency Preparedness and Response Plan (EPRP) • Camp Site Management Plan (CSMP) or Worker Accommodation Plan (WAP) • Community Health and Safety (CHS) Management Plan including Traffic Management Plan (TMP) • Waste Management Plan (WMP) (see Appendix-6) • Chance Find Procedure (CFP) (see Appendix-5) • Chemicals and Hazardous Materials Management Plan • Water Supply and Wastewater Management Plan • Labor Management Plan including Code of Conduct (to be prepared in accordance with TULIP LMP) • Grievance Mechanism (GM) The Contractor will prepare a training program and provide training to all his workers, before they start working on site, on basic environmental, social, health and safety risks associated with the proposed construction works and the worker's responsibility. The training program will be repeated on three-monthly basis. The Contractor's training program will also cover topics related to Code of Conduct (CoC) such as sexual harassment (SH) particularly towards women and children, violence, including sexual and/or gender-based violence (GBV) and respectful attitudes while interacting with the local community.	Low	Included in the Project cost	*Preparation:* E&S Consultant *Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
PR-ES.02	Deficiencies in the permitting and approvals	Moderate	A permission/approval log will be created, and permissions will be tracked through this log. All necessary permissions/approvals (design approvals, land acquisition documentations, water usage permits, official views from the institutions, etc.) will be obtained before construction starts. An "EIA Exemption Letter" and "Environmental Permit Exemption Letter" official letters will be obtained from the relevant authority. A contract/agreement or protocol will be signed by the Contractor before the starting of the construction works with the relevant Yozgat municipalities regarding wastewater acceptance. In case Çekerek Municipality WWTP is not suitable for wastewater disposal, Yozgat Municipality WWTP or Sorgun Municipality WWTP can be considered as an alternative. Wastewater to be generated within the scope of the Project will not be given to facilities without an environmental permit for wastewater discharge, and will not be discharged to the soil, surface water, lake, or any	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Preconstruction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			other receiving bodies in any way without obtaining an environmental permit for wastewater discharge. An agreement will be signed with the licensed Landfill Facility in Yozgat Municipality for the disposal of domestic wastes to be generated under the Project. The project will not be started before the necessary static calculations, ground survey studies, etc. related to the project design are completed.			
PR-LA.01	Land acquisition processes	Moderate	Before the land acquisition process begins, the relevant Resettlement Plan will be approved and disclosed on the official website. Following this, a public consultation meeting will be held to ensure community participation. The plan will then be finalized and used as a guiding document for land acquisition activities. According to this report, the contractor's mobilization will not take place until the land acquisition processes are fully completed. If any activity requires land acquisition for worker camps, these camps cannot be established until the land acquisition process is fully completed, as defined in the Resettlement Plan. Active and efficient consultations will be carried out with the affected persons through Stakeholder Engagement Plan (SEP) and Grievance Mechanism (GM).	Low	Included in the Project cost	*Preparation:* E&S Consultant *Implementation:* Contractor DSI PIU *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
PR-SE.01	Inefficient engagement with the local community	Moderate	The stakeholders will be identified, and a SEP will be prepared by the E&S Consultant and approved by PIU. Public consultation meetings will be held before the finalization of the ESMP, and the public concerns/suggestions will be integrated into the final ESMP. GM will be established, and the public will be informed how to deliver their grievances and how their grievances will be resolved through this GM during the public consultation meetings. Before construction activities start, the ESMP, SEP and RP will be disclosed to the public. The information on the start and finish dates of construction and working periods and the permits obtained from the provincial/district municipality and other relevant institutions/organizations (if necessary) will be shown by the operations owner in a signboard that is easily visible to all personnel at the construction site. Development of tools to support the participation of vulnerable/disadvantaged persons and/or groups in the early stages of the Project.	Low	Included in the Project cost	*Preparation:* E&S Consultant *Implementation:* Contractor DSI PIU *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
PR-NDP.01	Failure in the structures due to the natural disasters	Moderate	Designs of the pipeline network will be made in accordance with the national legislations (Regulation on the Structures to be Built in Natural Disaster Areas). DSİ will ensure that an effective dam safety program is in place and that full-level inspections and assessments have been conducted and documented to the satisfaction of the Bank. In case additional dam safety measures or remedial work are necessary, DSİ will ensure that the dam is designed and its construction is supervised by competent professionals. For high-hazard cases involving significant or complex remedial work, DSİ will employ a panel of independent experts to oversee the process. Within the scope of the Project, all issues in this Dam Safety Report (see Appendix-8) will be complied with and the measures specified in the report will be taken. An Emergency Action Plan will be prepared by DSI for the construction of Kösrelik Pond. Emergency Action Plans including natural disaster risks (especially flood and inundation risks) will be prepared for material quarries and work will not start until the measures in these plans are taken.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
PR-CHS.01	Access from outside and accidents that may occur due to lack of security of the project area	High	The construction areas will be enclosed with a fence/curtain, etc. before the construction starts. Warning signs will be hung. A Traffic Management Plan (TMP) will be prepared by the Contractor, either within the Community Health and Safety Management Plan or separately. Security personnel will be assigned for control of the construction site access. During the preparation of Risk Assessment Report and Emergency Preparedness and Response Plan to be prepared by the Contractor, community health and safety risks and impacts will be included in the assessment and plan.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Preconstruction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
PR-OHS.01	Accidents and injuries resulting from incorrect conditions or behaviors	High	Consultations, assessments and plans regarding OHS and labor management and working conditions will be made by the Contractor and shared with PIU/PCU to prevent or, if unavoidable, reduce to an acceptable level every potential risk factor prior to the construction activities. OHSMP including Risk Assessment and EPRP will be prepared by Contractor. During the preparation of Risk Assessment Report and EPRP, community health and safety risks and impacts will be included in the assessment and plan. All the staff will participate in training sessions which include grievance mechanism (GM), gender-based violence (GBV), sexual exploitation and abuse (SEA), sexual harassment (SH), code of conduct (CoC) immediately after the recruitment process.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

* **Ref.**: Reference, **Sig.**: Significance

8.2 Mitigation Plan for Construction Phase

This section presents potential impacts, cost effective and feasible mitigation measures to reduce adverse environmental and social impacts to acceptable level, identified impact significance before and after mitigation, cost of mitigation (if substantial) and responsible parties for the construction phase. The mitigation measures in addition to the standard mitigation measures listed above chapter(s) are presented in Table 8-2 for construction phase.

Table 8-2. Environmental and Social Mitigation Plan for Construction Phase

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
CP-ES.01	Absence of an effective ESMS	Moderate	ESMP and other sub-management plans and procedures (WMP, TMP, OHSMP, EPRP, Risk Assessment, CMP/WAP, CHS Management Plan, CFP, etc.) prepared by the E&S Consultant and Contractor and approved by PIU/PCU, will be implemented throughout the Project lifetime. All management plans will be informed to all workers immediately after the recruitment and repeated if necessary. The approved ESMP will be implemented by the Contractors. An ESMS and GM together with the control and monitoring mechanisms will be implemented. Necessary responsible personnel in PIU, Contractor and Regional Directorate of DSI will be assigned for tracking and monitoring of the ESMP implementation and compliance.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-ES.02	Deficiencies in the permitting and approvals	Moderate	All permissions, official letters, approvals will be tracked through the permission/approval log. All necessary permissions/approvals (EIA Exemption Letter, Environmental Permit Exemption Letter, design approvals, land acquisition documentations, water usage permits, official views from the institutions, etc.) will be obtained before construction starts, and will be renewed during the construction phase, if necessary. The project will not be started before the necessary static calculations, ground survey studies, etc. related to the project design are completed.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-LS.01	Change in land use (except for land acquisition impacts)	Low	The work will be carried out only in the designated areas. If additional land is required, no work will be performed other than the designated areas unless the necessary permissions and approvals are obtained. Rehabilitation and restoration/landscaping activities will be performed after the construction works are completed. Around the excavated material stored (if any) at designated storage sites, if any, dikes will be established to prevent loss of soil. Excavation material will be re-used as appropriate or disposed of to the nearest licensed waste storage site. At the end of the construction of the Kösrelik Pond, the material quarries will be closed, and the relevant areas will be rehabilitated as described in the Project Introduction Files. The provision of the allocation permits for the material quarries will be complied with during the construction of Kösrelik Pond and the Project.	Negligible	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-LS.02	Decrease in soil quality	Low	The use of only the designated worksites and routes for the construction machinery and equipment will be ensured. Machinery and equipment will be checked regularly for leaking oil and fuel. In the event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly. Spill kits, absorbent pads and absorbent sands will be available on Project construction sites continuously. Containers containing hazardous chemical materials will be placed in sealed vessels to prevent spills and leaks. Those vessels will not be in direct contact with the soil, and impermeable floor will be ensured by membranes, etc. All chemicals storage containers, including diesel fuel, and hazardous liquid waste drum/containers will be placed in secondary containment in order to minimize the risk of soil contamination.	Negligible	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			Mitigation measures given in CP-WM.01, CP-WM.02, CP-WM.03 and CP-WM.04 for waste management and CP-WW.01 for wastewater will be implemented. In case of breakdown of vehicles, during the mandatory maintenance/repair activities to be carried out in the field, laying tarpaulins against spills in the work area, keeping spill kits, providing bottom pans under liquid equipment are also provided by the Contractor. Topsoil will be stored temporarily on the pipeline with a maximum height of 2 m and a maximum slope of 45 degrees. The subsoil material from the excavation will be temporarily stored in a way that it will not mixed with the topsoil, after the pipes are placed in the trenches, they will first be backfilled with subsoil and finally the topsoil of the pipeline side will be laid back. The excess subsoil will be stored in excavation storage areas to be approved by the Municipality or the District Governorship within the scope of the relevant regulation.			
CP-NDP.01	Emergency response in case of natural disasters	Moderate	Emergency Preparedness and Response Plan (EPRP) and Risk Assessment to be prepared will include the risks of natural disasters. Construction activities (especially excavation works) will be undertaken in dry weather conditions as much as possible in case of a flood event. The potential impact of surface runoff will be minimized by establishing proper drainage systems. Communication protocols will be established to ensure that workers receive immediate alerts and instructions in the event of a natural disaster. Access and egress routes for evacuation will be strategically planned and informed to all workers. Engaging with local authorities and the community remains vital. Informing them about the construction activities and potential flood or fire risks, as well as the measures being implemented to mitigate these risks, fosters a cooperative approach to managing those impacts. The provisions of “Regulation on the Structures to be Built in Natural Disaster Areas”, “Regulation on Building Constructions in Earthquake Zones” and “Regulation on Building Earthquake of Türkiye” and Disaster and Emergency Management Presidency will be strictly followed. Potential rockfalls will be detected and fixed or hinged connection barriers will be used in high potential areas. An Emergency Action Plan including flood and other types of natural disasters will be prepared by DSI for the operation phase of Kösrelik Pond. All issues in the Dam Safety Report (see Appendix-8) will be complied with and the measures specified in the report will be taken. It is recommended that the additional tests outlined in Tables 5.14 and 5.20 of the Dam Safety Assessment Report be conducted without delay. It is recommended addressing slope stability around the penstock by reducing the slope ratio to less than 1:2 and implementing protective measures in vulnerable areas near the spillway where rock and soil falls have been observed. It is advised to promptly implement these recommendations to enhance the construction quality and ensure the operational safety of the dam.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-AQ.01	Increased dust and exhaust emissions due to construction activities and machineries	Moderate	Dust from exposed work sites will be minimized by applying water on the ground regularly during dry season. Water to be used in this context will be provided by water tankers. Air emission levels will comply with national and international standards. Trucks will be covered with tarpaulins to reduce dust emission during transportation of excavation waste/soil or similar material. Loading and unloading operations will be carried out with due care, and materials will be prevented from scattering around. Construction work will be scheduled to reduce dust generation, and the operation hours of generators	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			/machines /equipment /vehicles will be reduced. Workers will be trained in the management of air emissions. Modern equipment and vehicles which meet the emission standards will be selected for construction works. GM will be kept active, and all grievances regarding dust and/or exhaust emissions will be recorded in the grievance log and resolved in a reasonable period of time. In case of complaints from the nearest sensitive receptors/stakeholders regarding dust generation air quality (especially dust) measurements will be conducted by an authorized laboratory. If measured parameters exceed project standards, additional mitigation measures will be implemented. Additional mitigation measures are windbreaks and mitigation measures for areas where most of the dust is generated, such as barriers, protective covers or screens. It will be ensured that the periodic inspections and maintenance of the construction machinery and equipment are valid, and they are used in line with the manufacturers' statements. Burning of site clearance debris (trees, undergrowth) or construction waste materials will be forbidden. Stockpile of Project materials at the site (if any) will be covered to avoid suspension or dispersal of fine soil particles during windy days or disturbance from stray animals. The vehicle speed driving through the community areas will be limited so that dust dispersion from vehicle transport is minimized. All vehicles to be used during construction activities are subject to the Regulation on Road Traffic will comply with the speed limits. It is recommended that vehicle speeds are limited to 30 km/h on unpaved surfaces. Dust prevention measures will be applied during the operation of the material quarries and washing-screening plant by regularly spraying water over dusty areas or materials to keep the dust from becoming airborne. Trucks will be covered with tarpaulins during material transportation from the material quarries. Loading and unloading operations in the material quarries will be carried out with due care, and materials will be prevented from scattering around.			
CP-NM.01	Increased noise levels due to construction activities and machinery	Moderate	Machinery, equipment and vehicles with lower sound power levels and sound reduced models will be preferred. Sound reducing tools/parts/attachments will be used for further minimization of the machinery and equipment, if necessary. Construction work will be scheduled to reduce noise level in consultation with the mukhtar and local community, and the operation hours of generators /machines /equipment /vehicles will be reduced. Construction machinery and equipment will not be operated simultaneously as much as possible. Machines that are intermittently used will be shut down or used minimally during operational breaks. Works will only be carried out during the day and not at night. A staggered work schedule will be adopted to minimize simultaneous high-noise operations. Noise measurements (if needed) will be carried out by an authorized laboratory in case of noise complaints from the nearest stakeholders. Working hours will be reduced, if necessary. Nearby sensitive stakeholders will be informed about the timing and content of construction activities. Workers will be trained in noise management. Grievance mechanism will be implemented and will be kept active. Workers will be provided with appropriate ear protection equipment. National and international limit values on noise level will be complied with. Noise barriers will be installed around the construction sites, if deemed necessary. It will be ensured that the periodic inspections and maintenance of the construction machinery and equipment are valid, and they are used in line with the manufacturers' statements. Machinery and equipment will be well-	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			maintained and fitted with appropriate noise reduction devices. All vehicles to be used in transportation activities shall comply with the speed limits specified in the Regulation on Road Traffic. Nearby sensitive stakeholders will be informed about the timing and content of blasting in K-1 Rock Material Quarry and Limestone Material Quarry. Vibration measurements (if needed) will be carried out by an authorized laboratory in case of vibration complaints from the nearest stakeholders.			
CP-WM.01	Risks due to improper waste management applications	Moderate	Waste management will be carried out in accordance with the "waste hierarchy". The Waste Management Plan prepared will be implemented. Personnel will be made aware of waste management through training. Separate collection containers will be placed for different types of waste. The Contractor will be responsible for waste management in the project areas. The project owner will add this issue to the contract with the contractor. Waste will be sent by licensed vehicles to licensed disposal/recycling companies contracted with Contractor. Project Owner will follow up on this situation. Waste records will be kept regularly. Boxes/containers will be positioned on site for hazardous and non-hazardous waste, and wastes will be sent by the Contractor to the licensed waste management facilities. If different categories of oils are produced from the works at the construction site, these oils will be stored separately. The maintenance of the construction machinery to be used during the construction phase will be carried out at authorized services. However, if waste accumulators or end-of-life tires are generated in the project area, they will be sent to the temporary waste storage area and delivered to licensed companies. No medical waste generation is expected in the project area. The nearest health center will be applied in case of health problems of the personnel to be employed. Maintenance materials such as oily rags, oil filters, used oil, etc. will be collected and disposed of properly. Those waste oils will never be disposed of on the ground and in water courses as it can contaminate soil and groundwater.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-WM.02	Increased waste generation	Moderate	The amount of all kinds of waste will be recorded and tracked. Training on the waste management and minimization of waste generation at site will be given to all personnel. The waste generated will be reused, recycled or recovered as much as possible. Recyclable and recoverable waste will be collected separately and sent to the nearest licensed recovery/recycling companies with licensed vehicles. Generated waste will be collected separately according to their types and disposed of properly in accordance with the national and international standards. The Waste Management Plan prepared will be implemented.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-WM.03	Hazardous waste generation	Moderate	Hazardous and non-hazardous wastes will be stored separately from each other in line with the national and international standards (WB ESSs). Hazardous waste will be securely stored on the construction site, away from structures, in durable containers placed on impermeable surfaces. Waste oils originating from machinery and vehicles will be stored in impervious containers that would be situated on impervious floor in accordance with the national and internation standards. Containers for the hazardous waste, which have a red color and labeled as “waste oil”, will be equipped with apparatus that would prevent over filling and will be filled till the designated level mark. Batteries utilized on construction sites and vehicle accumulators will be appropriately disposed of according to the consumer obligations outlined in relevant national regulation (Regulation on Control of Used Batteries and	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			Accumulators). This entails segregating used batteries from general domestic waste and transporting them to designated collection points, where available. The Waste Management Plan prepared will be implemented. Waste, whether hazardous or non-hazardous, will be clearly labeled with information such as waste code, quantity, and storage date, and stored according to their properties to prevent any adverse reactions. Hazardous waste generated will be sent to authorized companies or licensed hazardous waste management facilities according to their types. The receipts will be kept. Relevant notifications will be made to the MoEUCC system.			
CP-WM.04	Generation of excavation waste	Moderate	Excavation waste will be used as backfilling material as much as possible. Where the excavation waste cannot be used as a backfilling material, the waste will be sent to the nearest licensed landfill by the Contractor. The waste transfer records will be kept. Topsoil and subsoil will be managed separately, with specific storage locations to avoid mixing and pollution, if necessary. Stockpile height will be limited to 6 meters for subsoil and 2 meters for topsoil (if any).	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-WR.01	Environmental and health risks regarding the water use	Low	Drinking water of the personnel will be provided via bottled water or carboys in the scope of Project and its associated facilities (Kösrelik Pond and material quarries). Portable mobile toilets having their own impermeable wastewater collection reservoir will be provided for the needs of personnel. If that is not possible, an impermeable septic tank will be established. Utility water will be used from the village network/well by obtaining necessary permissions or bring to the site by tankers. The amount of drinking and utility water will be kept in records. Necessary analysis of the water, especially utility water, will be performed in case of water-borne diseases spread among the local community and workers. Surface runoff due to dust suppression activities will be prevented. No waste will be discharged into drainage channels, waterways, receiving water bodies and soil during the works on and around the construction sites. Protocols outlined in the chemical spill emergency plan will be promptly enacted in case of a spill/leakage.	Negligible	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-WR.02	Increased usage of water resources	Low	Drinking water of the personnel will be provided via bottled water or carboys. Utility water will be used from the village network/well by obtaining necessary permissions or bring to the site by tankers. The amount of drinking and utility water will be kept in records. Unnecessary use of water will be prevented, the personnel will be trained in the issue. Operations such as construction machinery and vehicle washing will not be carried out in the project area.	Negligible	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-WR.03	Decrease in the water resources or contamination risk	Low	In the event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly. Containers containing hazardous chemical materials will be placed in sealed vessels to prevent spills and leaks. All chemicals storage containers, including diesel fuel, and hazardous liquid waste drum/containers should be placed in secondary containment in order to minimize the risk of contamination of the surface water and groundwater bodies. The Waste Management Plan will be implemented efficiently, and no dispose of waste will be allowed to any water body or dry water bed. No water resources are used without obtaining necessary permission/approval from the relevant institution.	Negligible	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			The water to be used for dust suppression will be followed, and the amount will be recorded. Erosion and sediment control measures, such as silt fences and sediment traps, will be implemented, where necessary, to prevent runoff from contaminating the water bodies.			
CP-WW.01	Environmental and health risks due to inadequate wastewater management	Moderate	Portable mobile toilets having their own impermeable wastewater collection reservoir will be provided for the needs of personnel. If that is not possible, an impermeable septic tank will be established. Wastewater collected in the mobile toilets/septic tank will be vacuumed by the licensed sewer vehicles and sent to licensed Çekerek Municipality WWTP since there is no licensed WWTP in Aydıncık District. Necessary protocols/agreement regarding the vacuuming and treatment of the wastewater will be made with the Çekerek Municipality and/or relevant licensed companies. No direct discharge of wastewater into nature (water bodies, soil, etc.) will be allowed. Training in the wastewater management will be given to all personnel. The wastewater generated in the material quarries will be collected in impermeable septic tanks, collected by a licensed vacuum truck and sent to the nearest licensed wastewater treatment plant. Sedimentation tank will be constructed for washing-screening plant of F-1 Permeable Material Quarry.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-BC.01	Impacts on fauna	Low	Any encountered fauna species, especially *Testudo graeca* species will be relocated to alternative areas. Care will be taken and handled sensitively towards those species. Identify and protect, particularly nesting and feeding areas for birds, by establishing buffer zones where no construction activities are allowed. Schedule construction activities outside the breeding season to minimize disturbance to nesting birds. Implement erosion and sediment control measures, such as silt fences and sediment traps, to prevent runoff from contaminating the stream. After construction, disturbed areas will be restored by replanting native plant species and enhancing habitats to support fauna populations. Training workers on the importance of minimizing disturbance to wildlife.	Negligible	No additional cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-LA.01	Risks and impacts due to land acquisition processes	Moderate	Before the land acquisition process begins, the relevant Resettlement Plan will be approved and disclosed on the official website. Following this, a public consultation meeting will be held to ensure community participation. The plan will then be finalized and used as a guiding document for land acquisition activities. According to this report, the contractor's mobilization will not take place until the land acquisition processes are fully completed. If any activity requires land acquisition for worker camps, these camps cannot be established until the land acquisition process is fully completed, as defined in the Resettlement Plan. Landowners, land partners, and land users should establish effective communication. It will be ensured that communication is established with almost all heirs in jointly owned lands during the project implementation if it is necessary. Individuals who utilize lands through unofficial agreements will also be included in the dialogue. Illegal users on common areas will be involved to participation process, if any. It is necessary to ensure that especially elderlies, female household heads, people with handicapped, and non-Turkish speaker who are rightful owners, are effectively informed about the processes. The grievance mechanism needs to be expanded to include all vulnerable groups. Especially, seasonal workers will be included to participation process via additional consultation and interviews. Because they will probably meet income loss due to the temporarily vacant lands caused by construction activities. In addition, alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted by support of translator and/or bilingual individual within the villages. The expropriation plan and inventory document including title deeds of owner and shareholders will be	Low	Expropriation budget Livelihood restoration budget	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			prepared by the institution. All land acquisition processes must be completed during the pre-construction phase, and access must be provided to all rights holders This parameter has been evaluated under CP-LWC.02.			
CP-LA.02	Risks and impacts due to resettlement	Low	There is no planned physical resettlement. Economic replacement will be evaluated in line with assessments including by Resettlement Plan which cover livelihood restoration. This parameter has been evaluated under CP-LWC.02.	Negligible	Expropriation budget Livelihood restoration budget	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-SOC.01	Risks and impacts on the population and demography	Low	The anticipated labor demand (20 workers) can be met, if necessary, by sourcing from villages within the project area where youth unemployment is observed. Therefore, employment opportunities need to be discussed with the local community in advance. There is an anticipated impact caused by stop of temporary movement of seasonal agricultural workers. This impact can be observed more stable population structure for whole season. Population increase and labor influx can be anticipated due to the worker demand of the Contractor/s. The projected number of workers has been set at 20, but the exact figure will also be finalized only after the Contractor/s selection.	Negligible	No additional cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-SOC.02	Risks and impacts on the livelihood and employment	Moderate	The expropriation plan and inventory document has been prepared by the institution. In accordance with the data provided by these works, a RP will be prepared by the E&S Consultant and approved by PIU and WB. The results of appropriate evaluations can be included to ESMP after the completion of assessments related to livelihood and employment conditions. Without the mentioned plans, the only finding that can be expressed is that local representatives have concerns about the negative impacts of construction-related dust on crops and grazing lands. They expect dust suppression to be achieved through irrigation. Otherwise, agricultural income loss may be observed due to a decrease in crop yield. The expected impact here can be explained by concerns about a reduction in the income source, rather than the complete loss of it. Dust suppression is expected to be achieved through irrigation. Increase on local employment opportunities can be anticipated due to the worker demand of the Contractor/s. The projected number of workers has been set at 20, but the exact figure will also be finalized only after the Contractor/s selection. Due to the lands that will be temporarily left vacant because of land work, a loss of labor among seasonal agricultural workers in the region can be anticipated. Therefore, seasonal agricultural workers should also be included in the information and consultation processes related to the construction period. It can be mitigated by resettling of seasonal agricultural workers on alternative areas where can be gained agricultural income.	Low	Expropriation budget Livelihood restoration budget	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-SE.01	Inadequate stakeholder engagement	Low	Landowners, land partners, and land users will establish effective communication. It will be ensured that communication is established with almost all heirs in jointly owned lands. Individuals who utilize lands through unofficial agreements will also be included in the dialogue. Illegal users on common areas will be involved to participation process, if any. It is necessary to ensure that especially elderlies, female household heads, people with handicapped, and non-Turkish speaker, who are rightful owners, are effectively informed about the processes. The grievance mechanism will be expanded to include all vulnerable groups. Especially, seasonal workers will be included to participation process via additional consultation and interviews. In addition, alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted by support of translator and/or bilingual individual within the villages.	Negligible	No additional cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-SE.02	Communication with DVIG	Low	It will be ensured that communication is established with almost all heirs in jointly owned lands during the project implementation if it is necessary. The grievance mechanism will be expanded to include all vulnerable groups. The needs of vulnerable groups will be taken into account and tools specific to these needs will be developed. Time and place will be chosen to ensure vulnerable groups can facilitate their participation in stakeholder	Negligible	No additional cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			engagement processes. Seasonal workers will be included to participation process via additional consultation and interviews. Alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted by support of translator and/or bilingual individual within the villages. Informative documents will be provided as bilingual in required places. The places of the consultations will be organized to accommodate the need of elderlies, and people with handicapped.			PCU
CP-SE.03	Inadequate disclosure	Low	Landowners, land partners, and land users will establish effective communication. It will be ensured that communication is established with almost all heirs in jointly owned lands during the project implementation if it is necessary. Individuals who utilize lands through unofficial agreements will also be included in the dialogue. Illegal users on common areas will be involved to participation process, if any. It is necessary to ensure that especially elderlies, female household heads, people with handicapped, and non-Turkish speaker, who are rightful owners, are effectively informed about the processes. Tools will be developed to ensure the efficient participation of vulnerable groups in disclosure meetings. The grievance mechanism will be expanded to include all vulnerable groups. Alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted by support of translator and/or bilingual individual within the villages. Informative documents will be provided as bilingual in required places. The places of the consultations will be organized to accommodate the needs of elderlies, and people with handicapped. The final ESMP and SEP will be disclosed to public transparently, and public consultation meetings will be held to inform all stakeholders.	Negligible	No additional cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-SE.04	Ineffective GM	Low	It will be ensured that communication is established with almost all heirs in jointly owned lands. The grievance mechanism will be expanded to include all vulnerable groups. Alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted by support of translator and/or bilingual individual within the villages. Informative documents will be provided as bilingual in required places. All grievances will be recorded in a grievance log to easily followed-up, feedback and resolution. Complaint boxes will be placed at construction sites. Available places can be listed as follows: - Mukhtarship office, coffee house, village mosques, and Kösrelik Irrigation Cooperative in Kösrelik Villages. - Village mosque in Mercimekören. - Village mosque, and unemployed school building in Kocabekir. - Unemployed village mosque in Körpınar.	Negligible	No additional cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-LWC.01	Risks regarding the labor and working conditions (child labor, forced labor, unregistered employment, poor working conditions, etc.)	High	Labor Management (LM) Plan in accordance with the TULIP's LMP will be prepared and implemented by the Contractor. Child labor will be prohibited, children under 18 years of age will not be employed within the scope of the Project. Forced labor will be prohibited, voluntary employment will be ensured. Any sort of discrimination will be prohibited in the workplace, equal opportunities and fair treatment will be ensured. The rights to freedom of association and collective bargaining of the workers will be reserved.	Moderate	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			The working hours will be scrutinized to prevent exploitation, and minimum wage levels will be established to ensure a decent standard of living. All workers will receive written contracts with job description, working hours, wages, rights and responsibilities, Code of Conduct (including GBV and SEA/SH provisions), etc. Workers will be provided with information and documentation that is clear and understandable regarding their terms and conditions of employment such as their rights under national labor and employment law (which will include any applicable collective agreements). Social and sanitary facilities (toilets, resting areas, sanitary drinking and utility water, etc.) for the workers will be provided. A functional GM for workers will be established and implemented. All necessary trainings including basic and technical OHS, worker rights and responsibilities, environmental and social orientation trainings, emergency trainings, grievance mechanism, etc. will be given to all workers. Awareness raising activities such as training regarding GBV and SEA/SH will be provided to all Project workers. All records, especially regarding the contracts and trainings will be kept. Priority will be given to the local labor for job positions where possible and practical.			
CP-LWC.02	Risks and impacts regarding the workers' accommodation	High	For the camp sites, where the project workers will accommodate, the requirements of "Workers' Accommodation: Processes and Standards – A Guidance Note by IFC and the EBRD (European Bank for Reconstruction and Development)" will be implemented. The Contractor will arrange for safe drinking water, adequate shower and toilet facilities, rest and eating areas for workers. Tankless electric water heaters will not be used in showers. Central heating or storage water heaters will be used for showers. A Camp Site Management Plan (CSMP) or a Worker Accommodation Plan (WAP) will be prepared by the Contractor in line with the above-mentioned Guidance Note to avoid or reduce negative impacts on the community and maintain constructive relationships between local communities and workers' camps and establish standards on worker welfare and living conditions at the camps that provide a healthy, safe and comfortable accommodation and environment. Necessary transportation facilities are provided for the workers. The Contractor will provide a first aid kit with bandages, antibiotic cream, etc. at the camp site or health care facilities, and will identify and train an adequate number of workers to provide first aid during medical emergencies. Adequate space per worker will be ensured, with considerations for privacy. Proper ventilation, heating, and cooling systems will be installed. Safe electrical installations and fire safety measures will be implemented. Sleeping quarters will be equipped with proper beds, storage, and bedding. Sleeping areas will be separated based on gender. Laundry and drying areas will be provided. In the camp site, adequate waste disposal systems for general and hazardous waste will be installed; regular waste collection and disposal will be conducted; and proper sanitation for food waste and wastewater will be maintained. The camp site will be secured with controlled access. Adequate lighting in common areas and pathways will be ensured. Regular safety drills and training for workers will be conducted. An emergency response plan for the camp site will be prepared and put in place. All necessary emergency precautions (fire alarms, fire extinguishers, etc.) will be taken. Regular inspections and monitoring of accommodation standards will be performed. Designated management for overseeing accommodation standards will be assigned. Record-keeping of	Moderate	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			incidents, grievances, and maintenance activities will be maintained. Complaint boxes will be installed at the camp site. Clear communication of accommodation policies to workers will be carried out.			
CP-OHS.01	Inadequate OHS services, Work stoppage due to work accident (lack of appropriate OHS measures/unsafe work environment)	High to Moderate	Before starting the excavation work, the area to be excavated will be enclosed with barriers. Before starting the excavation work, OHSMP and risk assessment results will be implemented. The workers (both regular and contractual) on the project will be provided with training on the Health and Safety policy in place, and their role in the same and refresher courses will be provided throughout the life of the project. Employees are obligated to ensure their own health and safety, as well as that of other employees affected by their actions or work, in accordance with the occupational health and safety training they receive and the employer's instructions in this regard. Employees are obliged to use machinery, equipment, vehicles, tools, hazardous substances, transportation devices, and other production tools in compliance with the rules, use their safety features correctly, and refrain from removing or altering them arbitrarily. Employees are required to immediately notify the employer or employee representative when they encounter a serious and immediate health or safety hazard with machinery, equipment, vehicles, tools, facilities, or buildings at the workplace, or when they observe any deficiencies in protective measures. They are obligated to collaborate with the employer and employee representative to ensure occupational health and safety measures are upheld. Employees are obliged to use and maintain the provided personal protective equipment correctly. The Excavator to be used in the earth works will have undergone annual periodic maintenance, and it will be operated by an authorized user. During the construction phase, the required periods specified by the legal regulations, an Occupational Health and Safety Professional (Occupational Health and Safety Specialist and Occupational Physician) will be present. The contractor will ensure that no person is engaged in driving or operating construction machinery unless he/she is sufficiently competent and reliable, possesses the knowledge of risks involved in the operation and is medically examined periodically. The employee who will operate the work equipment will possess a G-class driver's license, a psychotechnical report, a defensive driving certificate, and a professional competency training document (SRC (Driver) certificate). The workers (both regular and contractual) on the project will be provided with training on the Health and Safety policy in place, and their role in the same and refresher courses will be provided throughout the life of the project. Employment of individuals under the age of 18 should be prohibited during project construction. Adequate training will be provided to staff about raising awareness about the use of Personal Protection Equipment (PPE) and emergency response measures. Job responsibility and shifting charts will be prepared so that no person shall be over exhausted, which will ultimately lead to accidents or injuries. Warning signs will also be marked at appropriate places. It shall also be ensured that good housekeeping at the construction site is maintained to avoid slips and falls. Risks related to the Covid-19 outbreak or any other similar will be determined for all departments through risk assessment studies. Earplugs shall be provided for workers placed in high-noise areas. Dropping/lowering of construction material or tool will be restricted and undertaken only under strict supervision if required. PPEs such as safety glasses with side shields, face shields, hard hats and safety shoes shall be mandatory at a construction site.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			During the construction phase, the source of vibration is the work equipment. To prevent employees from being harmed by vibration, regular maintenance of the work equipment will be conducted. Additionally, the working hours of employees will be adjusted. During the operational phase of material quarries, compliance with the provisions of the "Regulation on Occupational Health and Safety in Mining Workplaces," published in the Official Gazette No. 28770 on 19.09. 2013, is mandatory. Operations must be planned with consideration of the risks associated with soil collapse or compaction. The slope and height of excavation surfaces and benches should be appropriate to the soil's composition, stability, and the working methods employed. Before each operation, necessary checks must be conducted to prevent soil and rock falls from higher slopes and excavation surfaces relative to the working area and transportation routes. Measurement activities should be carried out where necessary. Work on flat and sloped surfaces should be executed in a manner that does not compromise the soil's stability and balance. The strength of benches and transport routes must be suitable for the vehicles being used. These areas should be constructed to allow for the safe movement of vehicles and must be maintained regularly. In areas where heavy machinery is at risk of falling, such as dumping sites and benches, adequate safety barriers of sufficient height must be installed. Excavated areas, construction sites, nearby pathways used by workers, and transport routes must be continuously monitored for risks of mass and block movement or falling debris. No personnel other than those assigned to these tasks may work in these areas until hazards have been mitigated. Explosive materials and capsules suitable for the structure of the enterprises are used. No one other than the igniters are allowed to take and ignite explosive materials. During blasting operations, the matters specified in Regulation on Occupational Health and Safety in Mining Workplaces will be complied with.			
CP-OHS.02	Inadequate emergency preparedness and response	High	The Contractor will prepare a site Emergency Preparedness and Response Procedure, which will be followed for the project. Warning signs regarding the emergencies such as fire extinguisher and first aid kit places, Emergency Muster Point, etc. will be marked at appropriate places. Necessary drills (flooding, earthquake, fire, etc.) will be performed with the participation of all workers, and the local community, if applicable. Additional mitigation measures will be taken by the Contractor for the flooding risks during the construction activities. Emergency Action Plans including natural disaster risks (especially flood and inundation risks) will be prepared for material quarries and the construction of Kösrelik Pond, and works will not start until the measures in these plans are taken. The Emergency Preparedness Plan to be prepared for the Kösrelik Pond construction should include strategies for immediate response, evacuation procedures, communication plans, and recovery efforts to minimize the potential damage and ensure the well-being of the affected communities. Emergency team members will be assigned and necessary trainings to those will be given.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-CH.01	In case of encountering chance find	Low	The Contractor will implement the Chance Find Procedure (CFP) attached to this ESMP. All workers will be trained in the CFP (given in Appendix-5) and how to proceed when encountered a chance find. In case of a chance find, the work will be stopped immediately, and Yozgat Museum Directorate or Çorum Museum Directorate (in case the chance find is encountered within the provincial boundaries of Çorum) will be informed. The actions required by the Museum Directorate will be taken by the Contractor.	Negligible	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Construction Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
CP-CHS.01	Risks and impacts on the health, safety and security of the local community	High	To prevent unauthorized access to the construction site, the construction site will be surrounded by fence/curtain/protection tape, and uncontrolled entrances will be prevented. Warning signs should be hung. During the preparation of Risk Assessment Report and EPRP, community health and safety risks and impacts will be included in the assessment and plan. Security personnel will be hired and trained in the CoC, gender and cultural sensitivities, SEA/SH, etc. Alternative pedestrian passages will be ensured for the local community. The safety of the passages will be ensured for the local community, especially the ones where their houses are adjacent to the construction area. The GM will be implemented effectively. The social responsible and how to deliver grievances will be informed to the local community. The provisions of the Dam Safety Report (see Appendix-8) for the Kösrelik Pond will be implemented.	Moderate	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU
CP-CHS.02	Risks and impacts on the local traffic due to Project's traffic and transportation activities	Moderate	Traffic and warning signs will be placed around and near the project area. The project area will be made visible. The TMP prepared, if any, will be implemented. Local people will be informed about potential hazards and risks through brochures and posters left in common areas frequently used by local people such as mukhtars' offices, mosques, or coffee houses. The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. All drivers involved in the project will be informed about road safety, speed limits, and traffic rules to be followed during the project, and requirements to be observed. The condition of roads used by construction vehicles will be regularly monitored and timely maintenance will be conducted to repair any damage caused by the increased traffic. Dedicated access routes will be established for construction vehicles that avoid residential areas. Strict speed limits for construction vehicles, particularly when passing through residential areas or near pedestrian crossings will be implemented. Traffic control personnel will be employed to manage vehicle movement during peak times and ensure safe passage for pedestrians, if necessary. The GM will be implemented effectively. The social responsible and how to deliver grievances will be informed to the local community.	Low	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU

* **Ref.**: Reference, **Sig.**: Significance

8.3 Mitigation Plan for Operation Phase

This section presents potential impacts, cost effective and feasible mitigation measures to reduce adverse environmental and social impacts to acceptable level, identified impact significance before and after mitigation, cost of mitigation (if substantial) and responsible parties for the operation phase. The mitigation measures in addition to the standard mitigation measures listed above chapter(s) are presented in Table 8-3 for operation phase. It should be noted that the operation of the irrigation pipeline network (the Project) will be the responsibility of an irrigation union, which has not been determined yet.

Table 8-3. Environmental and Social Mitigation Plan for Operation Phase

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
OP-ES.01	Absence of an effective ESMS	Moderate	ESMP and other sub-management plans and procedures (Waste Management Plan, Traffic Management Plan, Occupational Health and Safety Plan, Emergency Preparedness and Response Plan, Chance Find Procedure, etc.) will be prepared by the E&S Consultant and the Maintenance/ Repair Contractor and approved by PIU, will be implemented throughout the Project lifetime. All management plans will be informed to all workers immediately after the recruitment and repeated if necessary. The approved ESMP will be attached to the contracts of the Maintenance/ Repair Contractor and will be implemented during the maintenance and repair works. An ESMS and GM together with the control and monitoring mechanisms will be implemented. Necessary responsible personnel in PIU, Maintenance/ Repair Contractor and Regional Directorate of DSI will be assigned for tracking and monitoring of the ESMP implementation and compliance.	Low	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-ES.02	Deficiencies in the permitting and approvals	Moderate	All permissions, official letters, approvals will be tracked through the permission/approval log as in the construction phase. All necessary permissions/approvals (design approvals, land acquisition documentations, water usage permits, official views from the institutions, etc.) will be obtained before maintenance and repair work starts, and will be renewed, if necessary. The project will not be started before the necessary static calculations, ground survey studies, etc. related to the project design for the maintenance and repair are completed.	Low	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU Specialists appointed by PCU
OP-LS.01	Chance in land use / land occupancy	Negligible	The work will be carried out only in the designated areas. If additional land is required, no work will be performed other than the designated areas unless the necessary permissions and approvals are obtained. Rehabilitation and restoration/landscaping activities will be performed after the maintenance and repair works are completed, where necessary. Around the excavated material stored (if any) at designated storage sites, if any, dikes will be established to prevent loss of soil. Excavation material will be re-used as appropriate or disposed of to the nearest licensed waste storage site.	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU Specialists appointed by PCU
OP-LS.02	Decrease in soil quality	Low	The use of only the designated worksites and routes for the machinery and equipment will be ensured. Machinery and equipment will be checked regularly for leaking oil and fuel. In the event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly. Spill kits, absorbent pads and absorbent sands will be available on Project site continuously. Containers containing hazardous chemical materials will be placed in sealed vessels to prevent spills and leaks. All chemicals storage containers, including diesel fuel, and hazardous liquid waste drum/containers should be placed in secondary containment in order to minimize the risk of soil contamination. Mitigation measures given in OP-WM.01, OP-WM.02 and OP-WM.03 for waste management and OP-WW.01 for wastewater will be implemented.	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU Specialists appointed by PCU
OP-PM.01	Pesticide Use and	Moderate	Mitigation measures in Pesticide Management Plan (Appendix-7) will be implemented.	Low	No additional cost	*Implementation:*

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
	Management		Trainings will be provided to farmers for proper use of fertilizers, pests and disease management. The use of bio-pesticides will be encouraged and the use of chemical pesticides will be minimized where possible.			DSI PIU DSI Regional PIU Farmers *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-NDP.01	Emergency response in case of natural disasters	Moderate	Emergency Preparedness and Response Plan (EPRP) and Risk Assessment will be prepared by the Maintenance/ Repair Contractor and will include the risks of natural disasters, especially floods. Since the maintenance and repair works will be performed on channels, additional precautions will be taken while working on the bed in case of any flood event. The activities (especially excavation works) will be undertaken in dry weather conditions as much as possible. Potential rockfalls will be detected and fixed or hinged connection barriers will be used in high potential areas. An Operation and Maintenance Plan (O&MP) should be prepared to guide the dam operation, maintenance and surveillance. The DSI should prepare and implement the O&MP to practice proper dam operation and maintenance and surveillance and ensure the safety operation of the dam. The plan should be prepared and finalized 6 months prior to the first filling of the reservoir. The DSI is strongly recommended to prepare and finalize the EPP one year prior to the initial filling of the reservoir. The EPP should include strategies for immediate response, evacuation procedures, communication plans, and recovery efforts to minimize the potential damage and ensure the well-being of the affected communities.	Low	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU Specialists appointed by PCU
OP-AQ.01	Increased dust and exhaust emissions due to construction activities and machineries	Low	Dust from exposed work sites will be minimized by applying water on the ground regularly during dry season. Water to be used in this context will be provided by water tankers. Air emission levels will comply with national and international standards. Trucks will be covered with tarpaulins to reduce dust emission during transportation of excavation waste/soil or similar material. Loading and unloading operations will be carried out with due care, and materials will be prevented from scattering around. Maintenance and repair work will be scheduled to reduce dust generation, and the operation hours of generators /machines /equipment /vehicles will be reduced. Workers will be trained in the management of air emissions. Modern equipment and vehicles which meet the emission standards will be selected for construction works, if any construction/excavation work will occur. GM will be kept active, and all grievances regarding dust and/or exhaust emissions will be recorded in the grievance log and resolved in a reasonable period of time. Dust measurements (if needed) will be carried out by an authorized laboratory in case of any complaints from the nearest stakeholders regarding dust generation. If the measured levels indicate possible pollution from the project, mitigation measures will be developed for the areas where most of the dust is generated, such as windbreaks and barriers, protective covers or curtains. It will be ensured that the periodic inspections and maintenance of the construction machinery and equipment are valid, and they are used in line with the manufacturers' statements. Burning of site clearance debris (trees, undergrowth) or waste materials will be forbidden. Stockpile of Project materials at the site (if any) will be covered to avoid suspension or dispersal of fine soil particles during windy days or disturbance from stray animals. The vehicle speed driving through the community areas will be limited so that dust dispersion from vehicle transport is minimized.	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
OP-NM.01	Increased noise levels due to construction activities and machinery	Low	Machinery, equipment and vehicles with lower sound power levels and sound reduced models will be preferred. Sound reducing tools/parts/attachments will be used for further minimization of the machinery and equipment, if necessary. Maintenance and repair work will be scheduled to reduce noise level in consultation with the mukhtar and local community, and the operation hours of generators /machines /equipment /vehicles will be reduced. The machinery and equipment will not be operated simultaneously as much as possible. Machines that are intermittently used will be shut down or used minimally during operational breaks. Works will only be carried out during the day and not at night. Noise measurements (if needed) will be carried out by an authorized laboratory in case of noise complaints from the nearest stakeholders. Working hours will be reduced, if necessary. Nearby sensitive stakeholders will be informed about the timing and content of construction activities. Workers will be trained in noise management. Grievance mechanism will be implemented and will be kept active. Workers will be provided with appropriate ear protection equipment. National and international limit values on noise level will be complied with. Noise barriers will be installed around the construction sites, if deemed necessary. It will be ensured that the periodic inspections and maintenances of the construction machinery and equipment are valid, and they are used in line with the manufacturers' statements.	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-WM.01	Risks due to improper waste management applications	Low	Waste management will be carried out in accordance with the "waste hierarchy". The Waste Management Plan (WMP) will be prepared and implemented by the Maintenance/ Repair Contractor. Personnel will be made aware of waste management through training. Separate collection containers will be placed for different types of waste. The Maintenance/ Repair Contractor will be responsible for waste management in the project areas. The project owner will add this issue to the contract with the contractor. Waste will be sent by licensed vehicles to licensed disposal/recycling companies contracted with the Maintenance/ Repair Contractor. Project Owner will follow up on this situation. Waste records will be kept regularly. Boxes/containers will be positioned on site for hazardous and non-hazardous waste, and wastes will be sent by the Maintenance/ Repair Contractor. If different categories of oils are produced from the works at the construction site, these oils will be stored separately. The maintenance of the construction machinery to be used during the construction phase will be carried out at authorized services. However, if waste accumulators or end-of-life tires are generated in the project area, they will be sent to the temporary waste storage area and delivered to licensed companies. No medical waste generation is expected in the project area. The nearest health center will be applied in case of health problems of the personnel to be employed. Maintenance materials such as oily rags, oil filters, used oil, etc. will be collected and disposed of properly. Those waste oils will never be disposed of on the ground and in water courses as it can contaminate soil and groundwater. The waste generated will be reused, recycled or recovered as much as possible. Recyclable and recoverable waste will be collected separately and sent to the nearest licensed recovery/recycling companies with licensed	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			vehicles. Generated waste will be collected separately according to their types and disposed of properly in accordance with the national and international standards.			
OP-WM.02	Hazardous waste generation	Low	Hazardous and non-hazardous wastes will be stored separately from each other in line with the national and international standards (WB ESSs). Hazardous waste will be securely stored on the construction site, away from structures, in durable containers placed on impermeable surfaces. Waste oils originating from machinery and vehicles will be stored in impervious containers that would be situated on impervious floor in accordance with the national and internation standards. Containers for the hazardous waste, which have a red color and labeled as “waste oil”, will be equipped with apparatus that would prevent over filling and will be filled till the designated level mark. Batteries utilized on construction sites and vehicle accumulators will be appropriately disposed of according to the consumer obligations outlined in relevant national regulation (Regulation on Control of Used Batteries and Accumulators). This entails segregating used batteries from general domestic waste and transporting them to designated collection points, where available. The Waste Management Plan will be prepared and implemented by the Maintenance/ Repair Contractor. Waste, whether hazardous or non-hazardous, will be clearly labeled with information such as waste code, quantity, and storage date, and stored according to their properties to prevent any adverse reactions. Hazardous waste generated will be sent to authorized companies or licensed hazardous waste management facilities according to their types. The receipts will be kept. Relevant notifications will be made to the MoEUCC system.	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-WM.03	In case of excavation waste generation	Low	Excavation waste will be used as backfilling material as much as possible. Where the excavation waste cannot be used as a backfilling material, the waste will be sent to the nearest licensed landfill by the Maintenance/ Repair Contractor. Stockpile height will be limited to 6 meters for subsoil and 2 meters for topsoil (if any).	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-WR.01	Environmental and health risks regarding the water use and increased usage of water resources	Low	Drinking water of the personnel of the Maintenance/ Repair Contractor will be provided via bottled water or carboys. Portable mobile toilets having their own impermeable wastewater collection reservoir will be provided for the needs of personnel. If that is not possible, an impermeable septic tank will be established. Utility water will be used from the village network/well by obtaining necessary permissions or bring to the site by tankers. The amount of drinking and utility water will be kept in records. Necessary analysis of the water, especially utility water, will be performed in case of water-borne diseases spread among the local community and workers. Surface runoff due to dust suppression activities will be prevented. Protocols outlined in the chemical spill emergency plan will be promptly enacted in case of a spill/leakage. The amount of drinking and utility water will be kept in records. Unnecessary use of water will be prevented, the personnel will be trained in the issue. Operations such as machinery and vehicle washing will not be carried out in the project area. The Pond will be made safe in accordance with the Dam Safety Report (see Appendix-8). Warning signs such as "GÖLETTE YÜZMEK YASAKTIR", "SULAMA SUYUDUR, KESİNLİKLE İÇİLMEZ" will	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			be placed around the Pond. An EPP will be prepared for the operation phase of the Pond including the dam failuire, flood risks, water contamination, etc. Local communities will be informed about Dam Safety, and the EPP. Awareness trainings can be organized for farmers on the dangers of over-irrigation, efficient irrigation methods and appropriate agricultural practices for different cropping patterns.			
OP-WR.02	Decrease in the water resources or contamination risk	Low	In the event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly. Containers containing hazardous chemical materials will be placed in sealed vessels to prevent spills and leaks. All chemicals storage containers, including diesel fuel, and hazardous liquid waste drum/containers should be placed in secondary containment in order to minimize the risk of contamination of the surface water and groundwater bodies. The Waste Management Plan prepared by the Maintenance/ Repair Contractor will be implemented efficiently, and no dispose of waste will be allowed to any water body or dry water bed. No water resources are used without obtaining necessary permission/approval from the relevant institution. The water to be used for dust suppression will be followed, and the amount will be recorded.	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU Specialists appointed by PCU
OP-WW.01	Environmental and health risks due to inadequate wastewater management	Low	Portable mobile toilets having their own impermeable wastewater collection reservoir will be provided for the needs of personnel. If that is not possible, an impermeable septic tank will be established. Wastewater collected in the mobile toilets/septic tank will be vacuumed by the licensed sewer vehicles and sent to licensed Çekerek Municipality WWTP since there is no licensed WWTP in Kadışehri District. Necessary protocols/agreement regarding the vacuuming and treatment of the wastewater will be made with the Çekerek Municipality and/or relevant licensed companies. No direct discharge of wastewater into nature (water bodies, soil, etc.) will be allowed. Training in the wastewater management will be given to all personnel. İğdeli and Özdere streams, which provide the main discharge, have sufficient cross-section to create suitable outlet conditions for surface drainage channels and farmer ditches to be opened.	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-BC.01	Impacts on habitats	Low	Implement erosion and sediment control measures, such as silt fences and sediment traps, to prevent runoff from contaminating the stream. Establish spill prevention and response plans to quickly address any chemical spills or leaks, minimizing the risk of contamination. Water quality of the newly created Kösrelik Pond will be monitored seasonally. In addition, the pond will be surrounded by a fence to prevent wild animals from falling into it.	Negligible	No additional cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-SOC.01	Risks and impacts on the livelihood and employment	Low	After the final RP, appropriate evaluations related to livelihood and employment conditions can be included to ESMP. Without the mentioned plans, the only finding that can be expressed is that interviewed stakeholders have expectations related to increase both crop yield and cropping pattern by support of irrigation opportunities. There is no expected risk on social structure due to the employment on operation phase.	Negligible	No additional cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-SOC.02	Population and demography	Low	The expected employment number will not carry a major risk on social structure.	Negligible	No additional cost	*Implementation:* Irrigation Union Maintenance/Repair

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
						Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-SE.01	Inadequate stakeholder engagement	Low	It is necessary to ensure that especially elderlies, female household heads, people with handicapped, and non-Turkish speaker, who are rightful owners, are effectively informed about the processes. The grievance mechanism will be expanded to include all vulnerable groups. Especially, seasonal workers will be included to participation process via additional consultation and interviews. In addition, alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted by support of translator and/or bilingual individual within the villages.	Negligible	No additional cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-SE.02	Communication with DVIG	Low	The grievance mechanism will be expanded to include all vulnerable groups. The needs of vulnerable groups will be taken into account and tools specific to these needs will be developed. Alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted with the support of translator and/or bilingual individual within the villages. Informative documents will be provided as bilingual in required places. The places of the consultations will be organized to accommodate the need of elderlies, and people with handicapped.	Negligible	No additional cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-SE.03	Inadequate disclosure	Low	It is necessary to ensure that especially elderlies, female household heads, people with handicapped, and non-Turkish speaker, who are rightful owners, are effectively informed about the processes. Tools will be developed to ensure the efficient participation of vulnerable groups in disclosure meetings. The grievance mechanism will be expanded to include all vulnerable groups. Alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted with the support of translator and/or bilingual individual within the villages. Informative documents will be provided as bilingual in required places. The places of the consultations will be organized to accommodate the needs of elderlies, and people with handicapped. The final ESMP and SEP will be disclosed to public transparently, and public consultation meetings will be held to inform all stakeholders.	Negligible	No additional cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-SE.04	Ineffective GM	Low	The grievance mechanism will be expanded to include all vulnerable groups. Alternative consultation techniques will be provided to involve non-Turkish speaker people. These techniques can be conducted with the support of translator and/or bilingual individual within the villages. Informative documents will be provided as bilingual in required places. All grievances will be recorded in a grievance log to easily followed-up, feedback and resolution. Available places for complaint boxes can be listed as follows: - Mukhtarship office, coffee house, village mosques, and Kösrelik Irrigation Cooperative in Kösrelik Villages. - Village mosque in Mercimekören. - Village mosque, and unemployed school building in Kocabekir. - Unemployed village mosque in Körpınar.	Negligible	No additional cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-LWC.01	Risks regarding the labor and working conditions (child labor, forced labor, unregistered employment,	Moderate	Labor Management (LM) Plan in accordance with the TULIP's LMP will be prepared and implemented by the Maintenance/Repair Contractor. Child labor will be prohibited, children under 18 years of age will not be employed within the scope of the	Low	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
	poor working conditions, etc.)		Project. Forced labor will be prohibited, voluntary employment will be ensured. Any sort of discrimination will be prohibited in the workplace, equal opportunities and fair treatment will be ensured. The rights to freedom of association and collective bargaining of the workers will be reserved. The working hours will be scrutinized to prevent exploitation, and minimum wage levels will be established to ensure a decent standard of living. All workers will receive written contracts with job description, working hours, wages, rights and responsibilities, Code of Conduct (including GBV and SEA/SH provisions), etc. Social and sanitary facilities (toilets, resting areas, sanitary drinking and utility water, etc.) for the workers will be provided. A functional GM for workers will be established and implemented. All necessary trainings including basic and technical OHS, worker rights and responsibilities, environmental and social orientation trainings, emergency trainings, grievance mechanism, etc. will be given to all workers. Awareness raising activities such as training regarding GBV and SEA/SH will be provided to all Project workers. All records, especially regarding the contracts and trainings will be kept. Priority will be given to the local labor for job positions where possible and practical.			Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-OHS.01	Inadequate OHS services, Work stoppage due to work accident (lack of appropriate OHS measures/unsafe work environment)	High to Moderate	Before starting the excavation work for the maintenance/repair works, the area to be excavated will be enclosed with sturdy barriers. Before starting the excavation work for the maintenance/repair works, OHS Plan and risk assessment results will be implemented. Occupational Health and Safety Performance Reports should be prepared. The workers (both regular and contractual) on the project will be provided with training on the Health and Safety policy in place, and their role in the same and refresher courses will be provided throughout the life of the project. Employees are obligated to ensure their own health and safety, as well as that of other employees affected by their actions or work, in accordance with the occupational health and safety training they receive and the employer's instructions in this regard. Employees are obliged to use machinery, equipment, vehicles, tools, hazardous substances, transportation devices, and other production tools in compliance with the rules, use their safety features correctly, and refrain from removing or altering them arbitrarily. Employees are required to immediately notify the employer or employee representative when they encounter a serious and immediate health or safety hazard with machinery, equipment, vehicles, tools, facilities, or buildings at the workplace, or when they observe any deficiencies in protective measures. They are obligated to collaborate with the employer and employee representative to ensure occupational health and safety measures are upheld. Employees are obliged to use and maintain the provided personal protective equipment correctly. Only qualified and trained personnel will work with electricity. During the construction phase, the required periods specified by the legal regulations, an Occupational Health and Safety Professional (Occupational Health and Safety Specialist and Occupational Physician) will be present. The Maintenance/ Repair Contractor will ensure that no person is engaged in driving or operating construction machinery unless he/she is sufficiently competent and reliable, possess the knowledge of risks involved in the operation and is medically examined periodically. The employee who will operate the work equipment will possess a G-class driver's license, a psychotechnical report, a defensive driving certificate, and a professional competency training document (SRC (Driver)	Low	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			certificate). The workers (both regular and contractual) on the project will be provided with training on the Health and Safety policy in place, and their role in the same and refresher courses will be provided throughout the life of the project. Employment of individuals under the age of 18 should be prohibited during project construction. Adequate training will be provided to staff about raising awareness about the use of Personal Protection Equipment (PPE) and emergency response measures. Job responsibility and shifting chart will be prepared so that no person shall be over exhausted, which will ultimately lead to accidents or injuries. Warning signs will also be marked at appropriate places. It shall also be ensured that good housekeeping at the construction site is maintained to avoid slips and falls. Risks related to the Covid-19 outbreak or any other similar will be determined for all departments through risk assessment studies. Earplugs shall be provided for workers placed in high noise areas. Dropping/lowering of construction material or tool will be restricted and undertaken only under strict supervision if required. PPEs such as safety glasses with side shields, face shields, hard hats and safety shoes shall be mandatory at a construction site. During the construction phase, the source of vibration is the work equipment. To prevent employees from being harmed by vibration, regular maintenance of the work equipment will be conducted. Additionally, the working hours of employees will be adjusted.			
OP-OHS.02	Inadequate emergency preparedness and response	Moderate	The Maintenance/ Repair Contractor will prepare a site Emergency Preparedness and Response Procedure, which will be followed for the project. Warning signs regarding the emergencies such as fire extinguisher and first aid kit places, Emergency Muster Point, etc. will be marked at appropriate places. Additional mitigation measures will be taken by the Maintenance/Repair Contractor for the flooding risks during the maintenance and repair activities. Necessary drills (flood, earthquake, fire, etc.) will be performed with the participation of all workers, and the local community, if applicable. Emergency team members will be assigned and necessary trainings to those will be given. The DSI will prepare and finalize the EPP one year prior to the initial filling of the reservoir. The EPP should include strategies for immediate response, evacuation procedures, communication plans, and recovery efforts to minimize the potential damage and ensure the well-being of the affected communities.	Low	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU
OP-CHS.01	Risks and impacts on the health, safety and security of the local community	Moderate	During the operation phase, the access to the channel will be restricted by fences, including the road passages, and warnings will be hung on the fences. During the maintenance and repair works, to prevent unauthorized access to the site, the site will be surrounded by fence/curtain/protection tape, and uncontrolled entrances will be prevented. Warning signs should be hung. During the preparation of Risk Assessment Report and Emergency Preparedness and Response Plan, community health and safety risks and impacts will be included in the assessment and plan. During the maintenance and repair works, security personnel will be hired and trained in the code of conduct, gender and cultural sensitivities, SEA/SH, etc. Alternative pedestrian passages will be ensured for the local community. The safety of the passages will be ensured for the local community, especially the ones where their houses are adjacent to the maintenance/ repair work sites. The GM will be implemented effectively. The social responsible and how to deliver grievances will be informed	Low	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU

Mitigation Plan for Operation Phase						
Ref. No.*	**Potential Risks & Impacts**	**Impact Sig. Before***	**Mitigation Measures**	**Impact Sig. After***	**Cost**	**Responsible Parties**
			to the local community. The provisions of the Dam Safety Report (see Appendix-8) and EPP prepared for Kösrelik Pond will be implemented. Detailed risk assessments will be conducted to identify potential threats (e.g., dam failure, flooding, water contamination, etc.). The EPP will include evacuation plans, flood response measures and communication strategies integrating community-specific risks. Clear and well-marked access and evacuation routes will be maintained to ensure safe community movement in emergencies. Sirens, alarms, etc. will be installed to alert the community members in case of any community health and safety risks. Local communities will be informed about dam safety risks, early warning systems, and evacuation procedures.			
OP-CHS.02	Risks and impacts on the local traffic due to Project's traffic and transportation activities	Low	Traffic and warning signs will be placed around and near the road passages and working area. The site will be made visible. The TMP prepared, if any, will be implemented. Local people will be informed about potential hazards and risks during the maintenance/ repair works through brochures and posters left in common areas frequently used by local people such as mukhtar's offices, mosque, or coffee house. The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. All drivers involved in the project will be informed about road safety, speed limits, and traffic rules to be followed during the project, and requirements to be observed. The GM will be implemented effectively. The social responsible and how to deliver grievances will be informed to the local community.	Negligible	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU

* **Ref.**: Reference, **Sig.**: Significance

9 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

The monitoring, review and audit program for the preconstruction, construction and operation phases are detailed in Table 9-1, Table 9-2 and Table 9-3, respectively. They will be implemented to monitor the implementation of the environmental and social commitments of the ESMP requirements. The Project Owner will be responsible for ensuring that the Contractor and its subcontractors comply with applicable national/international regulations and lenders' requirements.

9.1 Monitoring Plan for Preconstruction Phase

The monitoring plan including parameters to be monitored, target/threshold value or action to be taken, location, method, frequency and cost of the monitoring activities and responsible parties for the preconstruction phase is given in the below table.

Table 9-1. Monitoring Plan for Preconstruction Phase

Monitoring Plan for Preconstruction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
MON-PR-ES.01	ESMS	Presence of ESMP and sub-management plans and procedures (LM Plan, OHS Plan, EPRP, Waste Management Plan, TMP, etc.) Assignment letters of the ESHS responsibles Training of the workers on ESMS, ESMPs	The ESMP and other relevant sub-management plans and procedures have been prepared and approved. The relevant ESHS responsible personnels in PIU, Contractor and Regional Directorates are assigned. All workers are informed or trained on the ESMS, ESMP and other sub-management plans.	Project offices in PIU, E&S Consultant, Contractor, DSI Regional Directorates Project site	Approval letters or e-mails of the ESMP, other plans and assignment letters.	Before the construction begins	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-PR-ES.02	Permits and approvals	Availability of permissions / approval log Presence of the necessary permissions/ approvals/ certifications, etc. Presence of Dam Safety Report	A log listing the necessary permissions/ approvals/ certificates is available, and 100% of permissions and approvals are taken.	Project offices in PIU, Contractor, DSI Regional Directorates	Review of the permission/ approval log and the relevant documents	Before the construction begins	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-PR-LA.01	Land acquisition processes	Availability of a RP Communication with the landowners, and user	RP has been prepared and approved. All the land acquisition processes are completed. Effective communication with the landowners, shareholders, people engaged to agricultural activities with unofficial agreements, illegal user, and seasonal agricultural workers	Project offices in PIU, E&S Consultant, Contractor, DSI Regional Directorates	Review of RP and approval letter Documentation regarding the land acquisition legal processes Records of consultation/ communication with the landowners Payment receipts	Before the construction begins (for RP and land acquisition processes) Continuous for communication with the landowners	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-PR-SE.01	Stakeholder Engagement and Communication with	Availability of a SEP Availability of an	SEP has been prepared and approved. An effective GM has been	Project offices in PIU, E&S Consultant,	Review of SEP and approval letter Documentation	Before the construction begins (for SEP and PCMs, and establishment of GM)	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:*	

Monitoring Plan for Preconstruction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
	the local community	effective GM Communication with all stakeholders Performing a Public Consultation Meeting (PCM)	established. Effective communication with all stakeholders At least two comprehensive PPMs have been held	Contractor, DSI Regional Directorates Project site local communities	regarding the GM and consultations with stakeholders Minutes of PCMs Number of participants (gender disaggretated)	Continuous for communication with all stakeholders and implementation of GM		DSI Regional PIU Specialists appointed by PCU	
MON-PR-NDP.01	Design approvals	Design approvals Presence of EPP for the construction of Kösrelik Pond Presence of EPRPs and Blasting Design Reports of the material quarries	All designs of the structures have been made according to relevant regulations and approved.	Project offices in PIU and Regional Directorates	Review of the designs, design approvals and design calculations	Before the construction begins	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-PR-CHS.01	Access to the Project area	Presence of fence/ curtain enclosing the project site, warning signs Availability of TMP, security personnel, Risk Assessment Report and Emergency Preparedness and Response Plan (EPRP) including CHS issues Presence of Dam Safety Report	Project site is enclosed by fences or curtains. TMP, Risk Assessment Report, and EPRP including CHS have been prepared. Security personnel has been employed.	Project offices for the documentations Project site for the physical measures	Review of TMP, Risk Assessment Report and EPRP including CHS issues Visual observation of the enclosing fences and warning signs Recruitment records of security personnel.	Before the construction begins	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-PR-OHS.01	Precautions taken in terms of OHS	Availability of OHS Plan, Risk Assessment Plan, EPRP OHS, GM, GBV, SEA/SH, CoC, etc. trainings of all project workers	OHS Plan, Risk Assessment Report, and EPRP have been prepared. All trainings within the scope of ESMP have been given to all project personnel.	Project offices for the documentations Project site for the physical measures	Review of documentations (OHS Plan, Risk Assessment Report, EPRP, training records of the workers, etc.) Visual observation of the physical precautions taken.	Before the construction begins	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	

9.2 Monitoring Plan for Construction Phase

The monitoring plan including parameters to be monitored, target/threshold value or action to be taken, location, method, frequency and cost of the monitoring activities and responsible parties for the construction phase is given in the below table.

Table 9-2. Monitoring Plan for Construction Phase

Monitoring Plan for Construction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
MON-CP-ES.01	ESMS	Presence and effective implementation of ESMP and sub-management plans and procedures Assignment letters of the ESHS responsibles Training of the workers on ESMS, ESMPs	The ESMP and other relevant sub-management plans and procedures have been implemented effectively. The relevant ESHS responsible personnels in PIU, Contractor and Regional Directorates are assigned. All workers are informed or trained on the ESMS, ESMP and other sub-management plans.	Project offices in PIU, Contractor, DSI Regional Directorates Project site	Approval letters or e-mails of the ESMP, other plans and assignment letters.	Continuous during construction	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-ES.02	Permits and approvals	Availability of permissions / approval log Presence of the necessary permissions/ approvals/ certifications, etc. Presence of Dam Safety Report and Dam Design approvals	A log listing the necessary permissions/ approvals/ certificates is available, and 100% of permissions and approvals are taken.	Project offices in PIU, Contractor, DSI Regional Directorates	Review of the permission/ approval log and the relevant documents	Continuous during construction	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-LS.01	Land use	Land used at the site Permissions for land use Compliance of the storage areas Grievances regarding land use	The land use is limited to the designated and approved areas. Zero grievances regarding land use	Project site	Visual observation at the site Review of the approvals/ permits regarding the extra land used, Reviews of grievances and resolutions	Continuous during construction Monthly for grievances	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-LS.02	Soil contamination	Presence of spill kits Training of the personnel on how to respond to spills Compliance of the chemical storage area	The spill kits are available at the project site and kept ready-to-be-used. All personnel have trained in how to intervene spills/leaks. The chemical storage area complies with the national and international standards.	Project site	Visual observation at the site for the physical precautions Review of the training records Incident records	Daily inspections for availability of the physical precautions Monthly for trainings Reporting in case of incidents	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-NDP.01	Emergency response in case of natural disasters	Presence of EPRP including natural disaster risks Presence of	Any risks and incidents related to natural disasters are responded immediately and recorded.	Project site	Visual observation at the site for the physical precautions	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU	

Monitoring Plan for Construction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		additional precautions regarding the risks identified. Presence of EPRPs for Kösrelik Pond and material quarries			Review of the EPRP			Specialists appointed by PCU	
MON-CP-AQ.01	Dust and exhaust emissions	Availability of the dust suppression methods and records Grievances regarding dust and exhaust emissions Availability of the related inspection records of the machinery and equipment Compliance of air quality measurements results (if any)	Dust and exhaust emissions comply with the national and international limit values. Zero grievance regarding the dust and exhaust emission. Dust suppression methods are available and effective. All machinery and equipment have valid inspection certificates.	Project site Near the sensitive receptors	Visual observation at the site for the physical precautions Review of the documentation (inspection records, dust suppression records, measurement reports, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters In case of grievance for measurements	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-NM.01	Noise generation	Availability of the sound reducing precautions Availability of the work schedule showing working hours Grievances regarding noise level Availability of the related inspection records of the machinery and equipment Compliance of noise and/or vibration measurements results (if any) Communication records to the local community regarding the blasting in material quarries	Noise levels comply with the national and international limit values. Zero grievance regarding the noise levels. Noise reducing methods and precautions are available and effective. All machinery and equipment have valid inspection certificates.	Project site Near the sensitive receptors	Visual and audial observation at the site for physical precautions Review of the documentation (inspection records, measurement reports, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters In case of grievance for measurements	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-WM.01	Effective waste management applications	Presence and implementation of WMP Training of the personnel in waste management Compliance of the	The WMP is prepared by the Contractor and fully implemented. The waste storage containers and areas fully comply with the national and international standards.	Project site	Visual observation at the site for the physical precautions Review of the documentation (waste records, training records of	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	

Monitoring Plan for Construction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		waste storage containers and area Waste records (including Kösrelik Pond and material quarries)	All kinds of records are kept separately by the waste type.		workers, WMP etc.)				
MON-CP-WM.02	Waste generation	Waste records (including Kösrelik Pond and material quarries) Recycled/recovered waste Availability of protocol/agreements made with the licensed companies	All kinds of records are kept separately by the waste type including recycled/recovered. Protocols/agreements have been made with the licensed waste recovery, recycling or disposal companies.	Project site	Visual observation at the site for the physical precautions Review of the documentation (waste records, waste amounts sent to licensed companies, protocols, agreements made with licensed companies, WMP etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-WM.03	Hazardous waste	Waste records (including Kösrelik Pond and material quarries) Compliance of the hazardous waste storage containers and area	The hazardous waste storage containers and areas fully comply with the national and international standards. All kinds of records are kept separately by the waste type.	Project site	Visual observation at the site for the physical precautions Review of the documentation (waste records, hazardous waste amounts sent to licensed companies, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-WM.04	Excavation waste	Amount/percent of excavation waste used as backfilling and sent to landfill Compliance of the topsoil and subsoil storage	At least 50% of the excavated waste is used as backfilling material. The topsoil and subsoil are stored separately in accordance with the national and international standards.	Project site	Visual observation at the site for the physical precautions Review of the documentation (waste records, excavation waste amounts sent to licensed companies, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-WR.01	Environmental and health risks regarding the water use	Bills/purchase records of drinking water of workers Availability of permissions of water use (if any) Compliance of the water analysis results	All records (bills, permissions, water analysis reports, etc.) are kept regularly.	Project site	Visual observation at the site for the physical precautions Review of the documentation (bills, purchase records, permissions, water analysis etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-WR.02	Use of water resources	Bills/purchase records of drinking water of workers Availability of permissions of water	All records (bills, permissions, water analysis reports, etc.) are kept regularly. All workers are trained on	Project site	Visual observation at the site for the physical precautions Review of the documentation (bills,	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by	

Monitoring Plan for Construction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		use (if any) Water use records Training of personnel in water use	water use.		purchase records, water use records, training records, water analysis, permissions etc.)			PCU	
MON-CP-WR.03	Water resources and use	Presence of spill kits Compliance of the hazardous chemical materials' containers and storage area Presence of MSDS of the chemicals Implementation of an WMP Amount of water used for dust suppression (if available) Presence of water use permission Grievances regarding water resources and use	WMP is implemented effectively, no waste dumping in water bodies. Spill kits are always available at the site for immediate response. MSDS of the chemicals are kept and followed. Unnecessary and unregistered water use is prevented. Zero grievance regarding water resources and use	Project site	Visual observation at the site for the physical precautions Review of the water use permissions, MSDSs, water use records Reviews of grievances and resolutions	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-WW.01	Wastewater management	Presence of impermeable septic tank Vacuum records of the septic tank Wastewater amount sent to Çekerek WWTP. Availability of the protocols/agreement for vacuuming and treatment made with Çekerek Municipality or licensed companies	All domestic wastewater is collected in an impermeable septic tank, and regularly sent to licensed WWTP to be treated via licensed vehicles. Relevant records regarding the wastewater generated and vacuumed are kept regularly. All necessary protocols or agreements are made with the licensed companies.	Project site	Visual observation at the site for the physical precautions Review of the documentation (vacuum records, wastewater amount generated, protocols/ agreement, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-BC.01	Impacts on *Testudo graeca* (Tortoise) and other fauna	Presence of *Testudo graeca* (Tortoise) and other fauna at the site	No *Testudo graeca* (Tortoise) or other fauna harmed due to the project activities	Project site	Visual observation at the site for presence of *Testudo graeca* (Tortoise) and other fauna	Daily inspections for presence of the species	No additional cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-LA.01	Risks and impacts due to land acquisition processes	Grievance log Official correspondences Title deeds Entitlement matrix	Zero grievances related to land acquisition	Project site	Grievance Mechanism	Prior to construction activities	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	

Monitoring Plan for Construction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		Eligibility criteria Asset inventory							
MON-CP-LA.02	Risks and impacts due to resettlement	Grievance log Official correspondences Title deeds Entitlement matrix Eligibility criteria Asset inventory	No need to physical resettlement Economic resettlement	Project site	Grievance Mechanism	Prior to construction activities	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-SOC.01	Risks and impacts on the population and demography	Grievance log Socio economic survey results, if any Consultation records	Tracking to population change during construction activities	Project site	Grievance Mechanism	Prior to construction activities	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-SOC.02	Risks and impacts on the livelihood and employment	Availability of a RP Communication with the landowners	Zero grievances related to income loss	Project site	Grievance Mechanism	Monthly	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-SE.01	Inadequate stakeholder engagement	Availability of a SEP Grievance log Consultation records Grievance log	Full list of all feedback including unstructured interviews, phone calls and site visit	Project site	Grievance Mechanism	Continuous	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-SE.02	Communication with DVIG	Availability of a SEP Grievance log Consultation records Grievance log	Full list of all feedback including unstructured interviews, phone calls and site visit	Project site	Grievance Mechanism	Continuous	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-SE.03	Inadequate disclosure	Availability of a SEP Grievance log Consultation records Grievance log Public consultation meeting minutes	Full list of all feedback including unstructured interviews, phone calls and site visit	Project site	Grievance Mechanism Review of meeting minutes	Continuous	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-SE.04	Ineffective GM	Availability of a SEP Grievance log Consultation records Grievance log	Full list of all feedback including unstructured interviews, phone calls and site visit	Project site	Grievance Mechanism	Continuous	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-	Labor and working	Presence and	The LM Plan is implemented	Project site	Visual observation	Continuous during construction	Included in the	*Implementation:*	

Monitoring Plan for Construction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
LWC.01	conditions	availability of LM Plan in place Recruitment records of the workers together with the written contracts Worker grievance records Training records	and complies with the TULIP's LMP. All labor employment and working condition processes comply with the national and international standards (especially WB ESS2 and ILO provisions). All workers have been given all necessary training. Zero worker grievance.		at the site for the physical precautions Review of the documentation (LM Plan, training records, recruitment records and contracts, grievance records, etc.)	phase for implementation of LM Plan and grievance mechanism Once during the recruitment process before the construction activities begin. For the training, immediately after the recruitment process before the construction activities begin. Then regularly.	Project cost	Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-OHS.01	OHS services and implementations (general, electrical works, first aid, use of PPE, trainings, accident/incident and near-misses, safety and warning signs, work permit, etc.)	Presence of OHS Plan, Risk Assessment Report, and OHS Performance Reports Presence of the sturdy barriers surrounding the construction area OHS-related training records of the workers Assignment of OHS Specialist and Occupational Physician Incident/accident and near-misses records Presence of warning and safety signs Periodic maintenance records of machinery and equipment Work permits	All OHS services and implementations comply with the national and international standards. Only qualified and trained personnel work with electricity. The construction site is secured by the barriers. All personnel are provided with the necessary basic and technical OHS training. All personnel are provided with the necessary PPE and use it. All necessary warning and safety signs are placed. All machinery and equipment have valid period maintenance records. Work permits are implemented throughout the facility using procedures and forms.	Project site	Visual observation at the site for the physical precautions Review of the documentation (plans, reports, training records, incident/accident and near-miss records, work permit forms, assignment letters, periodic maintenance records, etc.)	Continuous during construction phase	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-OHS.02	Emergency Preparedness and Response	Presence and implementation of EPRP Drill records Training records of emergency team Presence of emergency warning signs Presence of fire extinguishers and first aid kits Presence of additional measures regarding flooding	No incident/accident due to emergency situations.	Project site	Visual observation at the site for the physical precautions Review of the documentation (EPRP, drill records, training records, etc.)	Weekly inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	

Monitoring Plan for Construction Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		risks							
MON-CP-CH.01	Chance find (if encountered any)	Chance find records Official correspondence regarding the chance find Number and days of work stoppage due to chance find	No cultural assets are damaged due to project activities.	Project site	Visual observation at the site for the physical precautions Review of the documentation (chance find records, correspondence with Museum Directorate, work stoppage records, etc.)	Daily inspections for encountering a chance find Other parameters in case of chance find	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-CHS.01	Health, safety and security of local community	Presence of fence/curtain, and warning signs etc. for site access Availability of EPRP including CHS issues Recruitment records of security personnel Training records of security personnel Safe road alternatives Grievances regarding CHS and security Presence and implementation of Dam Safety Report and EPP for Kösrelik Pond	The project site is enclosed safely, and warning signs are hung. EPRP includes CHS issues. Security personnel are employed and trained on CHS issues. Safe road passages for local community are provided. Zero grievances regarding CHS and security	Project site	Visual observation at the site for the physical precautions Review of the documentation (EPRP, recruitment records, training records, grievance records etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	
MON-CP-CHS.02	Traffic safety	Presence of traffic and warning signs Availability of TMP Availability of posters and brochures regarding potential hazards and risks Training of the project drivers regarding traffic safety Grievances regarding traffic safety	Traffic related warning signs are available at the project site. Posters and brochures are hung and delivered to the local community. TMP is in place and implemented. All project drivers are trained on traffic safety rules at the site. Zero grievance regarding traffic safety.	Project site	Visual observation at the site for the physical precautions Review of the documentation (TMP, training records, posters/brochures, grievance records etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters	Included in the Project cost	*Implementation:* Contractor *Monitoring/Supervision:* DSI Regional PIU Specialists appointed by PCU	

9.3 Monitoring Plan for Operation Phase

The monitoring plan including parameters to be monitored, target/threshold value or action to be taken, location, method, frequency and cost of the monitoring activities and responsible parties for the operation phase is given in the below table.

Table 9-3. Monitoring Plan for Operation Phase

Monitoring Plan for Operation Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
MON-OP-ES.01	ESMS	Presence and effective implementation of ESMP and sub-management plans and procedures Assignment letters of the ESHS responsibles Training of the workers on ESMS, ESMPs	The ESMP and other relevant sub-management plans and procedures have been implemented effectively. The relevant ESHS responsible personnels in PIU, Maintenance/ Repair Contractor and Regional Directorates are assigned. All workers are informed or trained on the ESMS, ESMP and other sub-management plans.	Project offices in PIU, Maintenance/ Repair Contractor, DSI Regional Directorates Project site	Approval letters or e-mails of the ESMP, other plans and assignment letters.	Continuous during construction	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-ES.02	Permits and approvals	Availability of permissions / approval log Presence of the necessary permissions/ approvals/ certifications, etc. Presence of Dam Safety Report	A log listing the necessary permissions/ approvals/ certificates is available, and 100% of permissions and approvals are taken.	Project offices in PIU, Maintenance/ Repair Contractor, DSI Regional Directorates	Review of the permission/ approval log and the relevant documents	Continuous during construction	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-LS.01	Land use	Land used at the site Permissions for land use Compliance of the storage areas Grievances regarding land use	The land use is limited to the designated and approved areas. Zero grievances regarding land use	Project site	Visual observation at the site Review of the approvals/ permits regarding the extra land used, Reviews of grievances and resolutions	Continuous during construction Monthly for grievances	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-LS.02	Soil contamination	Presence of spill kits Training of the personnel on how to respond to spills Compliance of the chemical storage area	The spill kits are available at the project site and kept ready-to-be-used. All personnel have trained in how to intervene spills/leaks. The chemical storage area complies with the national and international standards.	Project site	Visual observation at the site for the physical precautions Review of the training records Incident records	Daily inspections for availability of the physical precautions Monthly for trainings Reporting in case of incidents	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-PM.01	Pesticide use and management	Presence and implementation of PMP Training	All kinds of records are kept separately by the pesticide type	Irrigation areas	Visual observation at the site for the physical precautions Interview with	Monthly site inspections for availability of the physical precautions Monthly interviews with farmers	Included in the operation cost	*Implementation:* DSI PIU DSI Regional PIU Farmers	

Monitoring Plan for Operation Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		Pesticide use records (amounts and types)			farmers regularly			*Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists assigned by PCU	
MON-OP-NDP.01	Emergency response in case of natural disasters	Presence of EPRP including natural disaster risks Presence of additional precautions regarding the risks identified. Presence of Dam Safety Report and EPP for Kösrelik Pond operation phase	Any risks and incidents related to natural disasters are responded immediately and recorded.	Project site	Visual observation at the site for the physical precautions Review of the EPRP	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-AQ.01	Dust and exhaust emissions	Availability of the dust suppression methods and records Grievances regarding dust and exhaust emissions Availability of the related inspection records of the machinery and equipment Compliance of air quality measurements results (if any)	Dust and exhaust emissions comply with the national and international limit values. Zero grievance regarding the dust and exhaust emission. Dust suppression methods are available and effective. All machinery and equipment have valid inspection certificates.	Project site Near the sensitive receptors	Visual observation at the site for the physical precautions Review of the documentation (inspection records, dust suppression records, measurement reports, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works In case of grievance for measurements	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-NM.01	Noise generation	Availability of the sound reducing precautions Availability of the work schedule showing working hours Grievances regarding noise level Availability of the related inspection records of the machinery and equipment Compliance of noise measurements results (if any)	Noise levels comply with the national and international limit values. Zero grievance regarding the noise levels. Noise reducing methods and precautions are available and effective. All machinery and equipment have valid inspection certificates.	Project site Near the sensitive receptors	Visual and audial observation at the site for physical precautions Review of the documentation (inspection records, measurement reports, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works In case of grievance for measurements	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-WM.01	Effective waste management applications	Presence and implementation of WMP	The WMP is prepared by the Maintenance/ Repair Contractor and fully	Project site	Visual observation at the site for the	Daily inspections for availability of the physical precautions	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair	

Monitoring Plan for Operation Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		Training of the personnel in waste management Compliance of the waste storage containers and area Waste records Availability of protocol/agreements made with the licensed companies	implemented. The waste storage containers and areas fully comply with the national and international standards. All kinds of records are kept separately by the waste type. Protocols/agreements have been made with the licensed waste recovery, recycling or disposal companies.		physical precautions Review of the documentation (waste records, training records of workers, waste amounts sent to licensed companies, protocols, agreements made with licensed companies, WMP etc.)	Monthly for other parameters during maintenance and repair works		Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-WM.02	Hazardous waste	Waste records Compliance of the hazardous waste storage containers and area	The hazardous waste storage containers and areas fully comply with the national and international standards. All kinds of records are kept separately by the waste type.	Project site	Visual observation at the site for the physical precautions Review of the documentation (waste records, hazardous waste amounts sent to licensed companies, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-WM.03	Excavation waste (in case excavation occurs)	Amount/percent of excavation waste used as backfilling and sent to landfill Compliance of the topsoil and subsoil storage	At least 50% of the excavated waste is used as backfilling material. The topsoil and subsoil are stored separately in accordance with the national and international standards.	Project site	Visual observation at the site for the physical precautions Review of the documentation (waste records, excavation waste amounts sent to licensed companies, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-WR.01	Environmental and health risks regarding the water use	Bills/purchase records of drinking water of workers Availability of permissions of water use (if any) Compliance of the water analysis results Training of personnel in water use	All records (bills, permissions, water analysis reports, etc.) are kept regularly. All workers are trained on water use.	Project site	Visual observation at the site for the physical precautions Review of the documentation (bills, purchase records, permissions, water analysis, training records etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-WR.02	Water resources and use	Presence of spill kits Compliance of the hazardous chemical materials' containers and storage area Presence of MSDS of the chemicals Implementation of an WMP	WMP is implemented effectively, no waste dumping in water bodies. Spill kits are always available at the site for immediate response. MSDS of the chemicals are kept and followed. Unnecessary and unregistered	Project site	Visual observation at the site for the physical precautions Review of the water use permissions, MSDSs, water use records Reviews of grievances and	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	

Monitoring Plan for Operation Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		Amount of water used for dust suppression (if available) Presence of water use permission Grievances regarding water resources and use Presence of warning signs Presence of EPP and Dam Safety Report Awareness and training record held for the local communities	water use is prevented. Zero grievance regarding water resources and use		resolutions				
MON-OP-WW.01	Wastewater management	Presence of impermeable septic tank Vacuum records of the septic tank Wastewater amount sent to Çekerek WWTP. Availability of the protocols/agreement for vacuuming and treatment made with Çekerek Municipality or licensed companies	All domestic wastewater is collected in an impermeable septic tank, and regularly sent to licensed WWTP to be treated via licensed vehicles. Relevant records regarding the wastewater generated and vacuumed are kept regularly. All necessary protocols or agreements are made with the licensed companies.	Project site	Visual observation at the site for the physical precautions Review of the documentation (vacuum records, wastewater amount generated, protocols/ agreement, etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-BC.01	Impacts on *Testudo graeca* (Tortoise) and other fauna	Presence of *Testudo graeca* (Tortoise) and other fauna at the site	No *Testudo graeca* (Tortoise) and other fauna harmed due to the project activities	Project site	Visual observation at the site for presence of *Testudo graeca* (Tortoise) and other fauna	Daily inspections for presence of the species	No additional cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-BC.02	Water quality monitoring	Physio-chemical water quality parameters	Water quality studies will be carried out and the quality of the water to be released to the environment will be monitored. In this context, the physico-chemical properties of the water will be monitored.	Kösrelik Pond	Physio-chemical water quality surveys	Seasonally	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-SOC.01	Risks and impacts on the population	Grievance log Socio economic	Tracking to population change during construction activities	Project site	Grievance Mechanism	Quarterly	Included in the operation cost	*Implementation:* Irrigation Union	

Monitoring Plan for Operation Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
	and demography	survey results, if any Consultation records						Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-SOC.02	Risks and impacts on the livelihood and employment	Availability of a RP Communication with the landowners	Zero grievances related to income loss	Project site	Grievance Mechanism	Semi Annual	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-SE.01	Inadequate stakeholder engagement	Availability of a SEP Grievance log Consultation records Grievance log	Full list of all feedback including unstructured interviews, phone calls and site visit	Project site	Grievance Mechanism	Continuous	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-SE.02	Communication with DVIG	Availability of a SEP Grievance log Consultation records Grievance log	Full list of all feedback including unstructured interviews, phone calls and site visit	Project site	Grievance Mechanism	Continuous	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-SE.03	Inadequate disclosure	Availability of a SEP Grievance log Consultation records Grievance log	Full list of all feedback including unstructured interviews, phone calls and site visit	Project site	Grievance Mechanism	Continuous	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-SE.04	Ineffective GM	Availability of a SEP Grievance log Consultation records Grievance log	Full list of all feedback including unstructured interviews, phone calls and site visit	Project site	Grievance Mechanism	Continuous	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	

Monitoring Plan for Operation Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
MON-OP-LWC.01	Labor and working conditions	Presence and availability of LM Plan in place Recruitment records of the workers together with the written contracts Worker grievance records Training records	The LM Plan is implemented and complies with the TULIP's LMP. All labor employment and working condition processes comply with the national and international standards (especially WB ESS2 and ILO provisions). All workers have been given all necessary training. Zero worker grievance.	Project site	Visual observation at the site for the physical precautions Review of the documentation (LM Plan, training records, recruitment records and contracts, grievance records, etc.)	Continuous during construction phase for implementation of LM Plan and grievance mechanism Once during the recruitment process before the construction activities begin. For the training, immediately after the recruitment process before the construction activities begin. Then regularly.	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-OHS.01	OHS services and implementations (general, electrical works, first aid, use of PPE, trainings, accident/incident and near-misses, safety and warning signs, work permit, etc.)	Presence of OHS Plan, Risk Assessment Report, and OHS Performance Reports Presence of the sturdy barriers surrounding the construction area OHS-related training records of the workers Assignment of OHS Specialist and Occupational Physician Incident/accident and near-misses records Presence of warning and safety signs Periodic maintenance records of machinery and equipment Work permits	All OHS services and implementations comply with the national and international standards. Only qualified and trained personnel work with electricity. The construction site is secured by the barriers. All personnel are provided with the necessary basic and technical OHS training. All personnel are provided with the necessary PPE and use it. All necessary warning and safety signs are placed. All machinery and equipment have valid period maintenance records. Work permits are implemented throughout the facility using procedures and forms.	Project site	Visual observation at the site for the physical precautions Review of the documentation (plans, reports, training records, incident/accident and near-miss records, work permit forms, assignment letters, periodic maintenance records, etc.)	Continuous during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-OHS.02	Emergency Preparedness and Response	Presence and implementation of EPRP Drill records Training records of emergency team Presence of emergency warning signs Presence of fire extinguishers and first aid kits Presence of additional measures	No incident/accident due to emergency situations.	Project site	Visual observation at the site for the physical precautions Review of the documentation (EPRP, drill records, training records, etc.)	Weekly inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	

Monitoring Plan for Operation Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		regarding flooding risks Presence of Dam Safety Report and EPP for the operation phase of Kösrelik Pond Presence of Risk Assessment for Kösrelik Pond's operational activities							
MON-OP-CH.01	Chance find (if encountered any)	Chance find records Official correspondence regarding the chance find Number and days of work stoppage due to chance find	No cultural assets are damaged due to project activities.	Project site	Visual observation at the site for the physical precautions Review of the documentation (chance find records, correspondence with Museum Directorate, work stoppage records, etc.)	Daily inspections for encountering a chance find Other parameters in case of chance find	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-CHS.01	Health, safety and security of local community	Presence of fence/curtain, and warning signs etc. for site access Availability of EPRP including CHS issues Recruitment records of security personnel Training records of security personnel Safe road alternatives Grievances regarding CHS and security Presence of Dam Safety Report and EPP of Kösrelik Pond	The project site is enclosed safely, and warning signs are hung. EPRP includes CHS issues. Security personnel are employed and trained on CHS issues. Safe road passages for local community are provided. Zero grievances regarding CHS and security	Project site	Visual observation at the site for the physical precautions Review of the documentation (EPRP, recruitment records, training records, grievance records etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	
MON-OP-CHS.02	Traffic safety	Presence of traffic and warning signs Availability of TMP Availability of posters and brochures regarding potential hazards and risks Training of the project drivers regarding traffic safety	Traffic related warning signs are available at the project site. Posters and brochures are hung and delivered to the local community. TMP is in place and implemented. All project drivers are trained on traffic safety rules at the site.	Project site	Visual observation at the site for the physical precautions Review of the documentation (TMP, training records, posters/brochures, grievance records etc.)	Daily inspections for availability of the physical precautions Monthly for other parameters during maintenance and repair works	Included in the operation cost	*Implementation:* Irrigation Union Maintenance/Repair Contractor, if necessary *Monitoring/Supervision:* DSI PIU DSI Regional PIU Specialists appointed by PCU	

Monitoring Plan for Operation Phase									
Ref. No.	**Issue**	**Parameters to be monitored**	**Target/Threshold Value/Action to be taken**	**Monitoring Location**	**Monitoring Method**	**Timing/Frequency of Monitoring**	**Cost of Monitoring**	**Responsible Parties**	**Supervision Observation and Comments**
		Grievances regarding traffic safety	Zero grievance regarding traffic safety.						

10 INSTITUTIONAL ARRANGEMENTS

10.1 Roles and Responsibilities for the Implementation of ESMP

Roles and responsibilities for the implementation of ESMP are listed in Table 10-1. The responsibilities are defined for the 12th Regional Directorate of DSI, E&S consultant, the specialists appointed by PCU, contractor and DSI PIU.

Table 10-1. Roles and Responsibilities[66]

Responsible Party	Responsibilities
DSI PIU	▪ Auditing 12th Regional Directorate of DSI for the compliance performance regarding the ESMP implementation. ▪ Guiding DSI staff and consultants for the requirements of public consultation, announcements, consultation and disclosure, cultural properties, natural protected areas, etc. ▪ Reviewing the project documents, providing comments to consultants ▪ Official approval of the documents and procedures according to the WB ESF requirements ▪ Monitoring and auditing environmental and social issues at the sites (including OHS issues) through data collected from the site visits. ▪ Preparation and submission of quarterly compliance reports, which detail the construction progress and compliance efforts undertaken during the quarter along with any issues encountered and their resolution status, to the World Bank.
12th Regional Directorate of DSI	▪ Overall responsibility for the full implementation of the ESMP. ▪ Providing data and technical support for the preparation of environmental and social impact and risk assessment study reports (ESMP and SEP). ▪ Preparation of bid documents during the implementation, conducting relevant processes in accordance with the national and international institutions' requirements ▪ Controlling of the Construction Contractor ▪ Assigning focal points for management of projects' E&S, OHS, stakeholder engagement and GM. ▪ Controlling of the technical and administrative progress of contract packages and the implementation of the points provided in ESMP and SEP on site together with E&S and OHS Experts (at least one Social Expert, one Environmental Expert and one OHS Expert) who will be involved in the Project Organization Chart. ▪ Reviewing monthly Environmental and Social Monitoring Reports (ESMRs) of Contractor and the specialists appointed by PCU. ▪ Preparing monthly compliance reports including data from ESMRs prepared by contractor and the specialists appointed by PCU and submitting to DSI PIU.
E&S Consultant	▪ Preparing the ESMP, SEP and RP for the approval of the DSI PIU, 12th Regional Directorate of DSI and WB. ▪ Taking a part in organizing the ESMP public consultation meeting to be held as part of the project. ▪ Finalizing the reports as per the concerns/opinions of the stakeholders.
Specialists appointed by PCU	▪ Involving Supervisory Contract Manager, Environmental Expert, full-time OHS Expert and Social Expert. ▪ Inspecting the contractor to ensure that the recommendations and requirements given in the ESMP are fulfilled. ▪ Supervising and inspecting the Contractor's activities (including the environmental, social and OHS issues) on site on a daily basis. ▪ Making the Contractor take necessary actions to eliminate/minimize environmental and social impacts in line with ESMP and conducting monitoring activities as specified in the ESMP. ▪ Continuously monitoring processes and actions undertaken by the contractor and

[66] Adapted from TULIP ESMF

Responsible Party	Responsibilities
	for identifying the measures to be taken by the contractor to deal with any areas of non-conformity. ▪ Checking that the necessary training is given to the personnel through periodic audits, on-site controls, reviewing records and reports. ▪ supervising the implementation of all environmental (including biodiversity) measures provided in the ESMP. ▪ supervising the health and safety measures throughout the project activities. ▪ supervising the implementation of community health and safety and social measures provided in the ESMP, as well as the implementation of SEP, and for reporting to the Project Owner regularly. ▪ Managing the GM and regularly monitoring the reporting of grievances to the Project Owner. ▪ Participating in stakeholder engagement activities. ▪ Non-conformities will be defined as any deviations from the contractual requirements of ESMP documentation.
Contractor	▪ Implementing the ESMP in line with the national and international standards and requirements. ▪ Preparing construction contractor related sub-management plans. ▪ Observing the compliances provided in the ESMP. ▪ Following up the monitoring requirements in the ESMP. ▪ Providing training to its personnel regarding the ESMP and raising awareness on environmental and social aspects and occupational and community health and safety issues. ▪ Promptly notifying any incident/accident to the specialists appointed by PCU, 12th Regional Directorate of DSI. ▪ Preparing and submitting monthly ESMRs including ESHS aspects of the project, mitigation measures taken, grievance logs, training records, and monitoring activities given in this ESMP.

Moreover, the Contractor will establish its site-specific sub-management plan in accordance with the ESMP prepared for the project, including OHS plans prior to commencing construction. The contractor will:

- Ensure they possess adequate E&S capacity with appropriately qualified and skilled personnel assigned on-site, as required.
- Develop site-specific ESMP and sub-management plans as necessary before commencing construction, incorporating them into their method statement, and submitting them to the specialists appointed by PCU and the 12th Regional Directorate of DSI for review and approval.
- Implement the mitigation measures outlined in the site-specific environmental and social assessment document and respective sub-management plans for construction activities.
- Perform control measures to minimize environmental and social impacts.
- Ensure that all staff and workers comprehend the procedures and tasks outlined in the environmental and social management program.
- Maintain environmental hygiene standards.
- Submit a monthly report on safeguard issues, mitigation efforts, and results throughout the construction period to the 12th Regional Directorate of DSI and the specialists appointed by PCU.
- Take responsibility for training staff and workers on environmental, social, and OHS aspects.
- Promptly inform the 12th Regional Directorate of DSI of any accidents and incidents and maintain an incident register at the construction site throughout the project duration.
- In case of any incident or accident related to the Project which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the

public and workers such as OHS accidents or that result in threatening community health and safety and the 12th Regional Directorate DSI will immediately (not later than 48 hours) and DSI PIU. MAF will inform the World Bank.

- Provide sufficient details regarding the incident or accident, findings of the Root Cause Analysis (RCA), indicating immediate measures taken or that are planned to be taken to address it, compensation paid, and any information provided by any contractor and supervising entity/consultant, as appropriate.
- The 12th Regional Directorate of DSI will submit the incident report, including RCA, precautions and compensation measures taken, within 30 business days. MAF will forward the incident report to the World Bank immediately upon receipt.
- Develop and implement Human Resource Management Procedure including working conditions, fair treatment, non-discrimination, equal opportunity, vulnerable/disadvantaged individuals/workers, GBV, SEA/SH, prevention of child labor and forced labor issues under the project's Labor and Employment Policy for construction phase.

10.2 Institutional Structure

The Project implementation structure is illustrated in Figure 10-1[66].

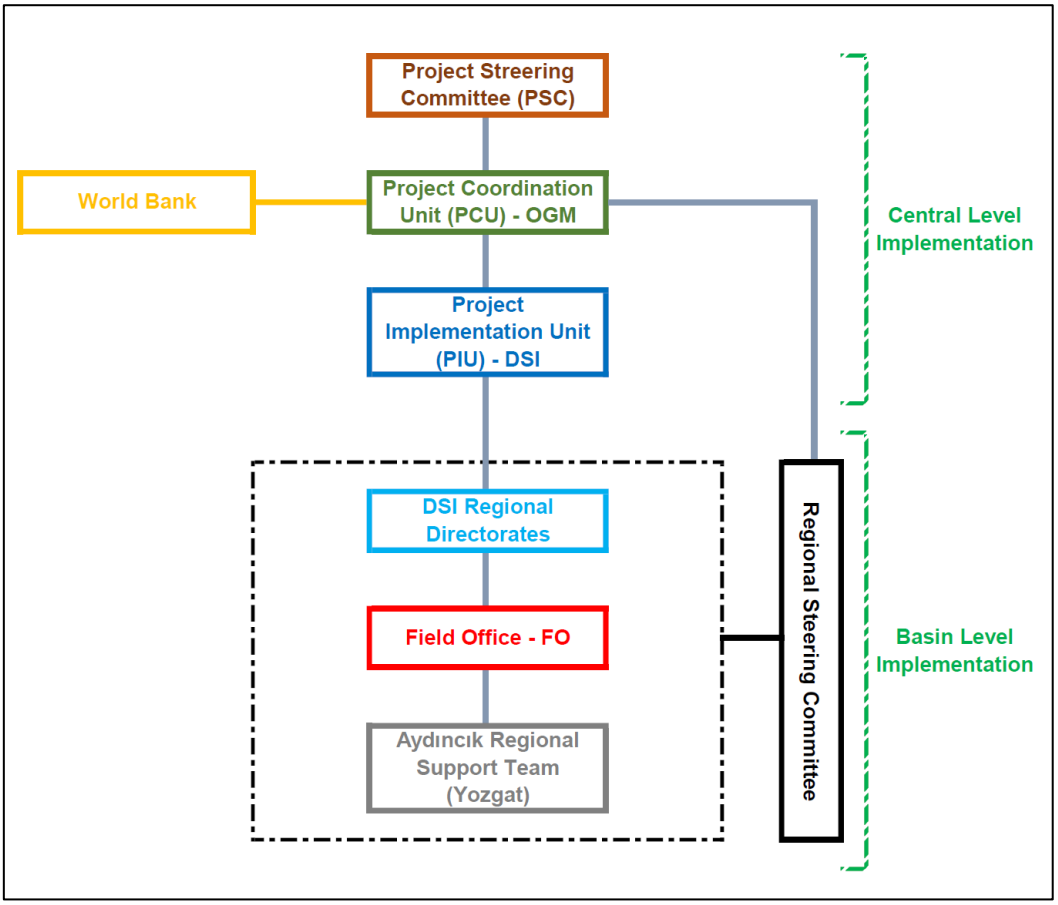

Figure 10-1. Project Implementation Structure[66]

The ESHS staff of the Contractor will be on-site based and implement the ESMP and SEP in accordance with the national legislation and international standards/requirements as given in this ESMP.

10.3 Capacity Development and Training

The E&S teams of DSI PIU, 12th Regional Directorate of DSI, Specialists appointed by PCU, and Contractor will include at least three technical experts - one acting as the environmental focal point, one as the social development/land acquisition focal point, and one as the OHS focal point. In addition, one archaeologist and one biodiversity expert will be involved on an as-needed basis. For the Project's environmental and social risk identification and monitoring, the PCU and central-level PIU will conduct and attend site visits during ESMP implementation. Moreover, this ESMP has been prepared as a capacity development tool for the Project.

The capacity development will be supported by the E&S training on the implementation of ESMP. This training will be given to all workers immediately after the recruitment process. The training will include but not limited to the following issues:

- Purpose of the ESMP regarding the Project activities.
- Requirements and provisions regarding the ESMP and SEP as well as the monitoring activities.
- Potential environmental, social, health and safety risks and impacts, and the mitigation measures of them.
- The establishment and steps of GM and responsible for the GM.
- Awareness regarding Gender-based violence (GBV), Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)
- Code of Conduct
- Community Health and Safety issues and traffic and road safety principles
- Waste management, environmental awareness, chance find procedure, etc.

The scope of a basic training program is given in the TULIP ESMF[67] and adapted to the Project (see Table 10-2).

Table 10-2. Scope of the Basic Training Program[68]

Target Audience	Content	Responsible	Schedule
All Project Workers	▪ General environmental and socioeconomic awareness ▪ Environmental and social sensitivity of the project area ▪ Mitigation measures ▪ Community issues ▪ Awareness of transmittable diseases, risk of SEA/SH ▪ Social and cultural values ▪ Grievance Mechanism ▪ Gender equality trainings ▪ Conflict management and Code of Conduct ▪ ESMP, SEP, RP and all associated management plans (traffic, waste management, labor management, OHS, etc.) ▪ GM implementation ▪ Chance Find Procedure ▪ Gender-based violence (GBV) ▪ OHS and Accident Investigation ▪ Root Cause Trainings	PIU and Contractor	Prior to the start of the construction activities To be repeated as needed.

[67] Available at https://www.ogm.gov.tr/tulip/cevresel-sosyal-yonetim-cercevesi/cevresel-ve-sosyal-yonetim-cercevesi
[68] Benefited from TULIP ESMF.

Target Audience	Content	Responsible	Schedule
	▪ Community Health and Safety		
Drivers	▪ Road safety ▪ Defensive driving ▪ Cultural values and social sensitivity ▪ Gender equality ▪ Conflict management and Code of Conduct	PIU and Contractor	Before and during the construction activities To be repeated as needed.
Villagers	▪ ESMP ▪ SEP and GM ▪ OHS management plan ▪ Community health and safety ▪ Conflict management	PIU and E&S Consultant Contractor (if needed)	Prior to the start of the construction activities To be repeated as needed.

10.4 Environmental and Social Reporting

There will be four types of environmental and social reporting for the Project, which are:

- Monthly Environmental and Social Monitoring Reports (ESMRs)
- Monthly Compliance Reports
- Quarterly Compliance Reports
- Semi-Annual Project Progress Reports

The contractor will prepare monthly ESMRs including ESHS aspects of the project, mitigation measures taken, grievance logs, training records, and monitoring activities given in this ESMP to 12th Regional Directorate of DSI and DSI PIU.

Specialists appointed by PCU will prepare the Monthly Compliance Reports which include details the construction and compliance activities completed during the month, and to track the resolution of any issues that may have occurred to DSI Regional PIU EHS team to be verified and submitted the to the DSI PIU. The Monthly Compliance Reports will give the following details during the period:

- Completed and remaining construction activities and estimated schedule,
- Summary of the grievance log including number and type of grievances received, pending and resolved and duration of resolution,
- Records of EHS incidents, accidents and near misses together with the RCAs, actions taken, etc.
- E&S Measurements and results (if any within the period)
- Mitigation measures taken together with the evidence such as photographs, procurement records, implementation records, etc.
- Daily compliance check records.

Combining the ESMRs of Contractor and Monthly Compliance Reports, DSI PIU will prepare and submit the Quarterly Compliance Reports to the WB which include:

- Key recommended follow-up issues, actions, timeframe, and responsible entity,
- Introduction, reporting period, and monitoring sites,
- Overview of completed construction tasks,
- Projection of remaining construction and timeline,
- Synopsis of compliance efforts,
- Progress in implementing the ESMP, encompassing monitored aspects such as waste management, safety protocols, pesticide handling and disposal, dust control, water quality, environmental incidents, training initiatives, etc.

- Oversight activities conducted by the DSI PIU and supervisory consultants, including site visits,
- Updated register of all EHS incidents and accidents throughout the project, along with any issued notices of non-compliance,
- Updates on unresolved past issues.

Moreover, DSI PIU will prepare and submit the Semi-annual Project Progress Reports to the WB. Those reports will include the environmental and social standards which will summarize the status of the Environmental and Social Commitment Plan (ESCP) and compliance with E&S all framework documents and all sub-project specific plans such as ESMP, RP, and SEP implementation based on its monitoring activities. The reports will additionally furnish comprehensive information regarding any grievances received, if applicable, during the corresponding reporting timeframe. This will encompass the nature and quantity of grievances, dates of receipt, and the status of actions taken, including both completed and pending complaints. These reports will underscore any concerns stemming from non-compliance with environmental and social standards, elucidating how they have been or are being rectified from the perspective of environmental and social standards.

Additionally, the site visit frequencies of the responsible parties are as:

DSI Regional PIU's E&S experts : at least weekly separately from Specialists appointed by PCU.
Contractor's OHS expert : on-site daily.
DSI Regional PIU's OHS expert : on-site at least weekly.
DSI PIU E&S experts : at least quarterly.

10.5 Disclosure of the ESMP

It falls upon the DSI to ensure full integration and implementation of this ESMP into all project preparation and planning activities. The ESMP will be included as part of any tender documentation for physical works within the project scope, and technical requirements outlined in project bid documents must undergo review against the ESMP to ensure appropriate mitigation measures are implemented. In accordance with the requirements of World Bank ESSs, the ESMP and its sub-management plans will be developed, publicly disclosed, and overseen by the DSI PIU. It will be ensured that the finalized, approved ESMP is locally available at provincial and district offices and easily accessible locations for affected groups, such as Mukhtars offices and local NGOs, as detailed in SEP document. It will also be published on the DSI's website. The ESMP is a living document subject to review, updates, and approvals as needed throughout project implementation. Each approved updated version will be disclosed through communication channels by the DSI. As part of environmental and social assessment studies, the ESMP and SEP have been prepared for disclosure. Additionally, the ESMP aligns and intersects with the Internal and External Grievance Mechanism Procedure to be developed for the project by the E&S Consultant before implementation.

11 STAKEHOLDER ENGAGEMENT AND GRIEVANCE MECHANISM

The Stakeholder Engagement Program outlines the main objectives and planned schedule of various stakeholder engagement activities. Its purpose is to foster effective communication, collaboration, and consultation with all relevant stakeholders throughout the project lifecycle.

11.1 Previous Stakeholder Engagement and Consultation Activities

In 2019, preparations started for the Çekerek River Basin Rehabilitation Project, involving meetings and surveys to gather information and engage stakeholders. In November 2020, a contract was signed with the FAO, making the project part of Türkiye's 2021 investment plan.

Stakeholder activities, like meetings and field visits, were promoted on the TULIP website. Due to COVID-19, remote consultations and online meetings were used to assess technical needs.

Meetings occurred with government units and agriculture offices in different areas. Progress evaluations and workshops were held to review project advancement.

A survey in 2023 collected data on farmers and project beneficiaries to guide project decisions.

Overall, the project depended on working closely with stakeholders and collecting detailed data to ensure success.

The details of the SEP implementations are given within the Project-specific SEP report (see CNR-PLN-TULIP-KSR-SEP-001)

11.2 Grievance Mechanism

Throughout the project, the Grievance Mechanism (GM) will be set up and operated. This includes both national and project-specific GMs, which are detailed here. The GM operates on several core principles: ensuring fairness, privacy, and protection from pressure or threats; resolving concerns outlined in the project's SEP promptly; offering a clear, open, culturally sensitive, and easy-to-reach consultation process; allowing for anonymous complaints, especially about social and environmental assessment; recognizing urgent grievances about community health, safety, and environmental risks, requiring immediate action to prevent harm; ensuring people can voice concerns without cost or fear of retaliation; and not blocking access to legal or administrative solutions. Complaint procedures will follow TULIP's Stakeholder Engagement Framework (SEF).

11.2.1 Current Grievance Mechanism

DSI will establish a grievance mechanism in line with international standards to address stakeholders' concerns, including those of PAPs. This mechanism will be easily accessible and responsive to various forms of feedback, such as grievances, complaints, requests, opinions, and suggestions. Efforts will be made to resolve grievances satisfactorily, with actions monitored and outcomes communicated to complainants. Complaints received by DSI will be integrated into TULIP's central mechanism, and multiple channels like phone, email, and written correspondence will be available for lodging complaints. A dedicated focal point within the TULIP project team will oversee the grievance process and report on its progress. TULIP will receive formal requests and grievances through CIMER and its online channels, with the DSI 12th Regional Directorate managing the overall project and grievance supervision, facilitated through communication channels on the DSI website.

The details of the SEP implementations are given within the Project-specific SEP (see CNR-PLN-TULIP-KSR-SEP-001)

11.2.2 National-Level Grievance Mechanism

Both internal and external stakeholders, including foreigners, can use national-level GMs for the project. The Presidency's Communication Center (CIMER) offers a centralized system for complaints, available to Turkish citizens, legal entities, and foreigners. This allows stakeholders to directly convey project-related grievances and feedback to state authorities. Additionally, individuals have the right to access information under the Right to Information Act, which can be done by submitting a written request through the Right to Petition or online. CIMER's contact information includes its website, call center, phone number, fax number, and mailing address. Similarly, the Foreigners Communication Center (YIMER) provides a centralized complaint system for foreigners, offering them a familiar channel to communicate project-related concerns to state authorities. YIMER's contact details include its website, call center, phone number, fax number, and mailing address.

11.2.3 World Bank Grievance Redress Service

WB has its own established mechanisms for addressing complaints. To provide stakeholders with alternative channels for accessing this institution's complaint resolution processes, the following contact details can also serve as an additional avenue for submitting complaints.

World Bank Grievance Redress Service

- Online access: https://wbgcmsgrs.powerappsportals.com/en-US/new-complaint/
- By e-mail: grievances@worldbank.org
- By letter or by hand delivery to the World Bank, physical address: Headquarters in Washington D.C, United States or World Bank Country Office -print and use the form.

11.2.4 Project-Level Grievance Mechanism

The DSI 12th Regional Directorate will assume responsibility for the overall management and supervision of the Project, which includes ensuring compliance with SEP requirements and managing grievances. To facilitate this process, communication channels, as outlined below are available on the DSI website and TULIP's official website.

DSI 12th Regional Directorate	Address	Osman Kavuncu Cad. DSİ 12. Bölge Müdürlüğü Kocasinan/ KAYSERİ
	Phone	0 352 336 28 50
	E-mail	dsi12@dsi.gov.tr, dsi.gnlmud@hs01.kep.tr
	Web	https://bolge12.dsi.gov.tr/Sayfa/Detay/1151
DSI 123rd Branch Office Yozgat	Address	Erdoğan Akdağ Mah. Adnan Menderes Bulvarı, Sivas Yozgat Yolu No:343, 66100 Köçekkömü/Yozgat Merkez/Yozgat
	Phone	0 354 212 55 33
	E-mail	dsi12@dsi.gov.tr, dsi.gnlmud@hs01.kep.tr
	Web	https://bolge12.dsi.gov.tr/Sayfa/Detay/1151
OGM - TULIP	Address	ORMAN GENEL MÜDÜRLÜĞÜ, Toprak Muhafaza ve Havza Islahı Dairesi Başkanlığı, Beştepe Mahallesi Söğütözü Caddesi No:8/1 06560 Yenimahalle / ANKARA
	Phone	+90 312 296 40 00 / 3485
	E-mail	tulip@ogm.gov.tr
	Web	https://www.ogm.gov.tr/tulip/

In addition to above communication channels, TULIP has a Grievance / Request Suggestion Application documents and forms in its website[69]. Those documentations with the embedded webpage links are as follows:

- Standard Operating Procedure for Grievance Mechanism document
- Information Text on the Processing of Personal Data for the Purpose of Receiving Grievance/Requests within the Scope of the TULIP Project
- Grievance Request Form
- Frequently Asked Questions (FAQ) on the Grievance Mechanism

[69] https://www.ogm.gov.tr/tulip/sikayet-talep-oneri-basvurusu

LIST OF APPENDICES

The following Appendices will be provided separately for the draft version.

Appendix-1: Official Correspondance and Decisions regarding National EIA
Appendix-2: Photographs of the Project Area
Appendix-3: Institutional and Legal Framework
Appendix-4: Environmental Calculations
Appendix-5: Chance Find Procedure
Appendix-6: Waste Management Plan
Appendix-7: Pesticide Management Plan
Appendix-8: Dam Safety Final Report (Phase 2)

Appendix-1: Official Correspondance and Decisions regarding National EIA

(the documents will be provided separately for the draft version of the ESMP)

Appendix-2: Photographs of the Project Area

(the documents will be provided separately for the draft version of the ESMP)

Appendix-3: Institutional and Legal Framework

(the documents will be provided separately for the draft version of the ESMP)

Appendix-4: Environmental Calculations

(the documents will be provided separately for the draft version of the ESMP)

Appendix-5: Chance Find Procedure

(the documents will be provided separately for the draft version of the ESMP)

Appendix-6: Waste Management Plan

(the documents will be provided separately for the draft version of the ESMP)

Appendix-7: Pesticide Management Plan

(the documents will be provided separately for the draft version of the ESMP)

Appendix-8: Dam Safety Final Report (Phase 2)

(the documents will be provided separately for the draft version of the ESMP)