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REPUBLIC OF TURKEY

Ministry of Agriculture and Forestry

General Directorate of Forestry

TURKEY RESILIENT LANDSCAPE INTEGRATION PROJECT (TULIP)

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

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Abbreviations

AFAD	Disaster and Emergency Management Presidency
BRB	Bolaman River Basin
CFP	Chance Find Procedure
CITES	Convention on International Trade in Endangered Species
CLQ	Community Level Surveys
CRB	Çekerek River Basin
ÇEM	General Directorate of Combating Desertification and Erosion
DKMP	General Directorate of Nature Conservation and National Parks
DSI	State Hydraulic Works
E&S	Environmental and Social
EBS	Eastern Black Sea
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
ESA	Environmental and Social Assessment
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESS	Environmental and Social Standards
EU	European Union
EUNIS	European Nature Information System
FIs	Financial Intermediaries
GDNCNP	General Directorate for Nature Conservation and National Parks
GDP	Gross Domestic Products
GHG	Greenhouse Gases
GT	Government of Turkey
GM	Grievance Mechanism
HPP	Hydropower Plants
IA	Implementing Agency
ILO	International Labor Organization
ILMP	Integrated Landscape Management Plan
INRM	Integrated Natural Resource Management
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Areas
KGM	General Directorate of Highways
LM	Labor Management
LMP	Labor Management Procedure

LRP	Livelihood Restoration Plan
MoAF	Ministry of Agriculture and Forestry
MoEU	Ministry of Environment and Urbanization
NGOs	Non-Governmental Organizations
NRM	Natural Resource Management
OGM	General Directorate of Forestry
OHS	Occupational Health and Safety
OP	Operational Policy
OSKI	Ordu Metropolitan Municipality Water and Sewerage Administrations
PAD	Project Appraisal Document
PAPs	Project Affected People
PCM	Project Coordination Meeting
PCU	Project Coordination Unit
PDEU	Provincial Directorate of Environment and Urbanizations
PIF	Project Information File
PIU	Project Implementation Unit
POM	Project Operational Manual
PPE	Personal Protection Equipment
PSC	Project Steering Committee
PSC	Public Sector Comparator
RCA	Root Cause Analysis
RF	Resettlement Framework
R-ST	Regional Support Team
RP	Resettlement Plan
SBO	Presidency of Strategy and Budget Office
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEF	Stakeholder Engagement Framework
SEP	Stakeholder Engagement Plan
SES	Socio-Economic Status
SPAs	Special Provincial Administrations
TRGM	General Directorate of Agricultural Reform
WB	World Bank
WSVA	Water Source Vulnerability Analysis
WTP	Water Treatment Plant
WWTP	Waste Water Treatment Plant

EXECUTIVE SUMMARY

Development Objective

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

Project Scope and Approach

The proposed project will support the GT in addressing the multitude of environmental and socio-economic challenges facing the Bolaman basin in the Eastern Black Sea and the Çekerek basin in Central Anatolia while enhancing the livelihood security and resilience of local communities against the risks and impacts of climate-induced landslides, flooding, and drought. The project will adopt an integrated landscape management approach in the targeted basins to achieve these objectives. Building on GT's and the Bank's previous experience in watershed rehabilitation, this project will design a participatory planning process to consider inputs from different stakeholder groups, allowing for the coordination and integration of solutions among various government agencies, and between government and local stakeholders.

Project Components

The project will also deploy integrated green and grey infrastructure solutions as both short-term and long-term responses to mitigate the risks of landslides, floods, and drought, and enhance climate resilience of the local population and ecosystems. Using Bolaman and Çekerek Basins as proof of concept, the project will set in motion a national program for landscape resilience. Component 1 will finance a variety of green and grey infrastructure measures, including the rehabilitation of forests and pastures and small-scale erosion, sedimentation, and flood control works upstream; sustainable and climate-smart agricultural practices and value chains and livelihood diversification activities; combined with resilient infrastructure systems for water supply, irrigation, and flood, landslide, and sediment control downstream, and the rehabilitation and construction of rural road networks to be climate and disaster-proofed. Component 2 will finance technical assistance for scaling-up the project approach to other priority areas and developing a national strategy or plan for landscape resilience and sustainable recovery, and the necessary institutional capacity building for implementing such strategy/plan; as well as all related project management activities, including monitoring and evaluation and environmental and social risk management. Component 3 (Contingent Emergency Response Component) is a provisional component and it will support carrying out emergency response and recovery efforts under an agreed action plan of activities designed as a mechanism to implement the government's response to an emergency. This ESMF will be updated as needed if Component 3 is activated.

Project Components and Eligible Sub-Projects

Project Components	Implementing Agency (IA)	Basin
Component 1: Investments in Resilient Landscape Integration in targeted areas		
Sub-Component 1.1. Green infrastructure and sustainable livelihoods		
(a) Forest landscapes and livelihoods upstream		
(i) Small-scale erosion, landslide, and flood control works upstream	OGM	Bolaman
(ii) Forest rehabilitation and sustainable management		

(iii) Forest pasture rehabilitation and sustainable management		Çekerek
(iv) Income generation and livelihood diversification for forest villages		
(b) Sustainable and climate-smart agricultural value chains		
(i) Sustainable and climate-smart agricultural practices	TRGM	Bolaman
(ii) Pasture rehabilitation and sustainable management outside forest lands		
(iii) Agricultural diversification and sustainable value chains for rural villages		Çekerek
Sub-Component 1.2. Resilient grey infrastructure		
(a) Resilient infrastructure for water security		
(i) Dams and small-scale multipurpose reservoirs	DSI	Bolaman
(ii) Irrigation works		
(iii) Flood and sedimentation control structures		Çekerek
(b) Resilient mobility		
(i) Resilient rural road rehabilitation	KGM	Bolaman
Component 2: Institutional Framework, Project Management, and Sustainability		
Sub-Component 2.1: Implementation Framework for Integrated Landscape Management		
(i) Support for the establishment of implementation framework	OGM	
(ii) Technical assistance for the development of guidelines to support the implementation of the national strategy for landscape resilience		
(iii) Assistance for development of ILMPs and MCPs for BRB and CRB		
(iv) Capacity building and awareness raising		
Sub-Component 2.2: Project management and sustainability		
(i) Strengthening capacity for day-to-day project management	OGM	
(ii) Environmental and social risk management		
(iii) Grievance redress, citizen engagement and communications		
(iv) Monitoring and Evaluation (M&E)		

Project Implementation Arrangements

The responsibility for overall project management and coordination will lie with the General Directorate of Forestry (OGM) under the Ministry of Agriculture and Forestry (MoAF). OGM is tasked with the protection and sustainable management of the country's forest resources, including soil rehabilitation and erosion control. It is the institution assigned with the responsibility for the implementation of integrated watershed rehabilitation projects under the Forest Code (Law No. 6831) and has previous experience in working with the Bank (through the Anatolia and Eastern Anatolia Watershed Projects) and more recently with other development partners. OGM operates through twenty-one (21) Departments located in its headquarters, twenty-eight (28) Regional Directorates of Forestry and twelve (12) Research Institute Directorates, with a total of approximately 40,000 staff at the national level. A project preparation team led by the Head of the Soil Conservation and Basin Rehabilitation Department of OGM was established early on and has been working closely with other agencies in the preparation of the project in a coordinated way.

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 (MoTI). TRGM is tasked with improving living conditions in rural areas by promoting the country's agricultural development and competitiveness and supporting agricultural infrastructure and capacities. DSI is the state agency responsible for water resources planning, operations, and management. Its primary focus is to plan, design, construct and operate dams, hydroelectric power plants, water supply and wastewater treatment infrastructure, irrigation schemes, and to implement structural flood protection and control measures. It has been affiliated with the MoAF since 2018. KGM is tasked with the identification, construction, and maintenance of highways, state and provincial road networks, and bridges to ensure safe transport across the country.

A ***Project Steering Committee (PSC)*** will be established to ensure effective coordination among Implementing Agencies (IAs), comprised of senior leadership from the IAs, other relevant DGs (such as DG of Water Management and DG for Combatting Desertification and Erosion), as well as representatives from the SBO and the MoTF. The PSC will be chaired by the Deputy Minister of the MoAF, with the Deputy General Director of OGM acting as the Secretariat. The key functions of the PSC will be to review the annual workplan and budget, monitor implementation progress, ensure effective institutional coordination, and provide instructions as needed for ensuring the delivery of project outputs and the achievement of project outcomes.

A ***Project Coordination Unit (PCU)*** will be established and housed within OGM at the central level, reporting directly to the Deputy General Director. The PCU will be responsible for overall project coordination and management, including coordinating the development of project-related annual work plans and budgets with the other IAs, project supervision, Monitoring and Evaluation (M&E), and communication with and reporting to the World Bank on fiduciary, environmental and social (E&S) aspects, and overall project implementation progress. The PCU will be headed by a Project Coordinator, appointed by OGM, who will be in charge of day-to-day project-related activities and coordination with other IAs for the execution of the project. The PCU will also act as the central-level Project Implementation Unit (PIU) for OGM, responsible for the implementation of OGM specific activities at the central level. The PCU will be composed of both OGM staff and specialized consultants on fiduciary, E&S, and technical aspects, among others.

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

Basin level implementation arrangements. Activities at the basin level will be implemented by the Regional and/or Provincial (RD/PD) (in the case of TRGM) Directorates of each IA and their respective Field Offices (FO). The project will be implemented in two sub-basins, within the borders of five provinces (Ordu, Tokat, Yozgat, Sivas, and Çorum). Thus, the project will be executed in three Regional Directorates of OGM (Giresun, Amasya, Kayseri), four Regional Directorates of DSI (Samsun, Kayseri, Sivas, Ankara), one Regional Directorate of KGM (Samsun), and five Provincial Directorates of TRGM (Ordu, Tokat, Yozgat, Sivas and Çorum).

Each RD/PD will have dedicated staff assigned by each IA to support project implementation through a **Regional Implementation Unit (RIU)**. To further enhance the capacity for implementation in the field and ensure effective coordination among the RDs/PDs, two **Regional Support Teams (RSTs)** will be established under two Regional Directorates of OGM at the basin level. The physical location of the Bolaman RST will be in the Ordu Province and the Çekerek RST will be located in the Yozgat Province. RSTs will include both staff and specialized consultants to strengthen the technical and administrative capacity of the IAs at the basin level. The exact required positions will be specified in the POM taking into consideration a flexible structure adaptable to the project needs during implementation.

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

Relevant departments of implementing agencies. A number of departments from each IA will be involved in the design and implementation of project activities. Each IA will assign a Focal Point from the main Department that will act as the PIU Head for overall project management and reporting and for coordinating project activities with other relevant Departments within the IA.

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

Purpose of the Environmental and Social Management Framework

In accordance with the World Bank's Environmental and Social Framework (ESF), the Environmental and Social Management Framework (ESMF) sets out the principles, guidelines, and procedures to assess environmental and social risks, and proposes measures to reduce, mitigate, and/or offset potential adverse environmental and social impacts and enhance positive impacts and opportunities of projects, activities, policies and /or regulations within the scope of the project activities. The budget for the implementation of the ESMF has been estimated as US$1,360,000, as detailed in Section 6.6 of the ESMF.

Regulatory Framework

This ESMF has been prepared in accordance with the national framework and the World Bank's ESF requirements. The Bank classifies projects into one of four categories: *(i) High Risk, (ii) Substantial Risk, (iii) Moderate Risk or (iv) Low Risk*. In determining the appropriate risk classification, the Bank takes into account relevant issues, such as the type, location, sensitivity, and scale of the project; the nature and magnitude of the potential environmental and social risks and impacts; and the capacity and commitment of the IAs to manage the environmental and social risks and impacts in a manner consistent with the ten (10) Environmental and Social Standards (ESSs). The ESSs contained in the ESF, set the requirements to be met by the Implementing Agencies (IAs) with respect to the identification, assessment and reduction/mitigation of social and environmental risks and impacts associated with projects supported by the Bank through Investment Project Financing.

For the Project, eight (as ESS 7 and ESS 9 will not apply) out of the ten ESSs establish the standards that the IAs and the Project will meet through the project life cycle. The list of the ESSs considered relevant for the Project are listed below.

ESS 1: Assessment and Management of Environmental and Social Risks and Impacts

ESS 2: Labor and Working Conditions

ESS 3: Resource Efficiency and Pollution Prevention and Management

ESS 4: Community Health and Safety

ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement

ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

ESS 8: Cultural Heritage

ESS 10: Stakeholder Engagement and Information Disclosure

Under the Turkey legislative and regulatory framework, Article 10 of the Environmental Law sets out the general scope of the Environmental Impact Assessment (EIA) procedure in Turkey, indicating that institutions, agencies and establishments that lead to environmental problems as a result of their planned activities are obliged to prepare Environmental Impact Assessment report or Project Information File (PIF).

There is a number of differences between the Turkish EIA Regulation and the WB impact assessment procedures. Major differences are related to categorization, scope of environmental and social assessment, and public consultation. The ESMF gives details for filling the gaps with the WB ESSs.

Overall Risk Rating of the Project

The overall environmental risk of the Project is rated by the WB as ***Substantial***. The rating is determined by the nature and magnitude of infrastructural improvements considered under the project (such as flood and landslide preventing structures), and by the limited environmental and social management capacity of the lead implementing agency.

The overall social risk of the Project is rated by the WB as ***Substantial*** due to contextual risks associated with the project and capacity of the multiple implementing state agencies to implement the ESF. Contextual risks include child labor associated with the hazelnut production in Turkey, and the use of seasonal migrant workers in agriculture, mainly hazelnut harvesting. The proposed investments may require land acquisition and economic and physical displacement of a small scale, and may generate temporary community health and safety risks and impacts, and occupational health and safety (OHS) risks among civil works contractors. Labor influx and Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) risk is estimated as low. The risk of forced labor is considered minimal.

The construction-related impacts are mainly air and noise emissions, generation of non-hazardous wastes, community health and safety (including traffic management related risks and gender-based violence risks), OHS risks, labour influx, land acquisition, loss of livelihoods, etc. There is also a risk of adverse impacts on potential sensitive archaeological areas, which are not known and legally not registered yet.

Even though at this stage there is limited information on sub-projects' exact locations, detailed designs, source of construction materials, the proposed sub-projects and their impacts are not anticipated to be complicated. The risk category of the proposed sub-projects is expected to be moderate for green investments whereas substantial are foreseen for the grey investments, mainly the sub-projects regarding dam and water storage structures. To address these risks, screening mechanism will be applied for all sub-projects. These proposed sub-projects will necessitate specific risk and impact assessment studies and specific mitigation measures depending on the project capacities in addition to the ecological, physical environmental as

well as social characteristics of the project location. High risk projects are not eligible for financing within the scope of the project.

Institutional Framework

Basin management policies are centrally planned in Turkey. The governmental organizations undertake the planning, development, management, maintenance, and monitoring and evaluation of programs related to river basin management. The local authorities are involved at the stage of implementation and non-governmental organizations are also indirectly involved in many activities.

DSI, KGM and TRGM will be represented at central level by PIUs; while OGM presence will lie with the PCU. As the leading IA, OGM will be coordinating the central-level PIUs in planning of sub-project specific ESF documents (ESIAs, ESMPs, SEPs, RPs, etc.). Implementation of these documents will be ensured through RD/PDs of IAs with the support of Regional Support Teams (RSTs) for each basin. In order to ensure a fluent conduct of works in compliance with WB ESSs, the PCU will be staffed with an Environmental and Social (E&S) Team with full knowledge of WB ESSs and their application. PCU will be setting the frameworks, guiding and supervising the PIUs who in turn coordinate with their RD/PDs for local level implementation of E&S safeguards. E&S Teams will comprise of in-house technical personnel and consultants to be hired from outside.

Capacity development activities will be performed in the PIUs and RD/PDs, particularly for the in-house E&S personnel. Consultants of the E&S Teams will also take role as trainers.

In order to ensure coordinated action among RD/PDs regarding Stakeholder Engagement Plans (SEPs) for all sub-projects, PIUs will design integrated SEPs in compliance with the Stakeholder Engagement Framework (SEF) set by the PCU.

Baseline Conditions

Bolaman Basin

Bolaman River Basin (BRB) is one of the sub-basins of the Eastern Black Sea Basin. It has a catchment area of 1,339.5 km², and covers an area of 158,886 hectares almost entirely within Ordu Province and with small parts in Tokat Province. Climate characteristics of the BRB is a major factor explaining the historical and active natural disasters and ongoing risks in the region, such as landslides and floods. Geomorphology of the basin explains the severe landslide incidences and erosion. The basin has a rough terrain with steep slopes, mainly influenced by surface flows. Literature cites deforestation for extending hazelnut plantations in the past, leading to increase of erosion prone areas.

Main environmental issues in Ordu province are soil pollution from uncontrolled dumping of domestic and hazardous wastes and manure deposition from livestock grazing; and surface water pollution from organic loads from grazing lands and hazelnut plantations by means of surface flow, as well as direct discharges of sewage into tributaries of Bolaman River.

The limited number of legally protected nature conservation areas and elements with high biodiversity value within BRB include Gaga Lake Natural site, Ulugöl Lake Nature Park and Natural Assets of 13 monument trees found in Perşembe, Fatsa and Çatalpınar districts within the project area.

According to the Ordu Province Terrestrial and Inland Water Ecosystems Biodiversity Inventory and Monitoring Work Final Report, there are a total of 34 Special Biodiversity Areas determined for the presence of priority biodiversity features: i) three habitat areas with high

target species diversity, ii) seven priority plant community areas and iii) 24 priority wildlife areas. According to the small-scale maps provided in Appendix 5 of the report, six of the 34 Special Biodiversity Areas overlap with the BRB project area. These are namely Perşembe Plateau-1, Perşembe Plateau-2, Ulugöl Nature Park-1, Ulugöl Nature Park-2, From Fatsa to Aybastı-800m, and Black Sea Coastal areas.

The Basin has been witnessing an outgoing migration from its rural areas. Between 1990 and 2007 the rural population in Ordu shrank by losing over 33% of its population. The small and fragmented land ownership in terrains with adverse conditions reduces agricultural productivity and is insufficient to support the livelihood of the residents.

The main economic activity is hazelnut cultivation which is carried out predominantly in August. Within this scarce source of livelihood support activities, the people in the basin resort to some wider alternatives. From mid-May to September animal husbandry becomes important in the high plateaus. Beekeeping is an important economic activity and beekeepers transport their beehives to other parts of Turkey for substantial periods of the season for the flowers to enrich the flavor of honey.

The population of the Bolaman basin, based on the estimation of the community survey results is 241,680.

Çekerek Basin

Çekerek Basin is bounded by 39◦ 30’ and 40◦ 45’ N latitudes, and 35◦ 15’ and 36◦ 15’ E longitudes. Çekerek River is approximately 276 km in length. The Çekerek River, which is one of the important branches of Yeşilırmak River, has narrow valley sections in many places depending on the ground structure in the basin.

Erosion intensity is quite high due to the fact that the basin has an arid-semiarid climate and its slope values are high, which has a great effect on the erosion severity in the land cover. The current state of erosion in the basin poses a serious threat.

While surface water is generally used for irrigation, groundwater is used as drinking and utility water purposes.

The basin extends over four provinces Tokat, Yozgat, Sivas and Çorum. In Tokat, agricultural sector has become the dominant in the provincial economy. Agriculture and livestock breeding have an important place in the economy of Yozgat Province, whereas agriculture sector in Sivas is not sufficiently developed, despite the fact that 97% of land is arable. The areas reserved for plant production are close to one million hectares.

There are only a few numbers of legally protected nature conservation areas and elements with high biodiversity value, within Çekerek Basin (1, 2). These include: Kadıpınarı and Oluközü Nature Parks in Akdağmadeni district of Yozgat and Ulukavak Nature Monument in Çekerek district of Yozgat.

Sewerage systems are mainly available in provincial centers. In rural areas, domestic waste waters are collected in septic tanks or directly discharged into the tributaries of Çekerek River. At the majority of the Çekerek basin, water pollution is caused by agricultural activities and domestic wastewater discharge.

Almost three quarters of the provinces in the basin live in the provincial and district centers. The biggest reason for the decrease in the Basin population is the rapid migration of the rural population.

The economy is largely based on agriculture and animal husbandry, and agriculture-based industry. The majority of the adult population works in the agricultural sector.

The main reason for the rural-dominated out-migration in the basin is the decline in the support level of the rural economic activities and the lack of employment.

Environmental and Social Risk Assessment and Management Process

A number of steps and procedures needs to be followed to determine and manage the environmental and social impacts of sub-project activities. The stages of this process are defined below

- E&S screening of sub-projects
- Risk categorization and E&S assessment of the proposed sub-projects
- Preparation of sub-project specific ESA documents
- Public consultation and disclosure of sub-project-specific E&S documents
- World Bank clearance for approval of the E&S documents
- Incorporation of E&S documents into bidding documents and later – into contracts for the provision of works
- Information disclosure
- Implementation of sub-project specific ESA documents
- E&S supervision and monitoring of sub-projects implementation

1 INTRODUCTION

1.1 Country Context

Turkey has achieved commendable economic and social development results between 2000 and 2016. Gross Domestic Products (GDP) per capita more than doubled from US$4,200 in 2000 to US$9,505 in 2018. Poverty incidence more than halved over 2002-2015, and extreme poverty fell even faster from 13 to 3.1 percent. During this period, Turkey urbanized dramatically, maintained strong macroeconomic and fiscal policy frameworks, opened to foreign trade and finance, harmonized many laws and regulations with European Union (EU) standards, and greatly expanded access to public services. However, growing economic vulnerabilities and a challenging external environment have threatened to undermine the sustainability of these achievements in the last few years. Turkey experienced a period of economic overheating in late 2017 and early 2018 and intense market volatility in mid-2018, resulting in contracting economic output, rising unemployment (from 10 percent in January 2018 to 14 percent in mid-2019), and high inflation (estimated at around 15 percent in September 2019). Recent adjustments in the Turkish economy have lessened external vulnerabilities and contributed to a more stable Lira. The economy grew in the first half of 2019 and has stabilized in the short-term. Nevertheless, stagnating output, high costs of production, and high consumer prices have also led to significant job losses and falling real wages. Poorer households have been most impacted because many low-income workers are employed in construction and agriculture – the sectors that saw a significant decline in jobs. Large regional disparities continue to persist, as rural poverty remains higher than urban poverty[1].

1.2 Sectoral and Institutional Context

Turkey has made progress in relatively decoupling growth from a range of environmental pressures, but rapid population growth, urbanization, and industrialization continue to take a heavy toll on the country's natural resources and the environment[2]. Soil erosion, land degradation, and desertification are among the most severe environmental problems in Turkey. Soil erosion, mostly caused by human factors coupled with geographic, topographic, climatic, and soil characteristics, is observed at very large scales, affecting about 86% of Turkey's lands[3] and putting most of the country under risk of desertification[4]. Turkey has undertaken considerable afforestation efforts for erosion control, adding a total of 2.14 million hectares of forest land since 1973. Despite this increase in forest cover, about 43% of Turkey's forests (9.64 out of 22.34 million hectares) are degraded[5], and the deterioration of forest ecosystems and their associated ecosystem services and loss of biodiversity continue to be critical issues. Water quality and scarcity are also of grave concern as they affect the availability of water resources for human consumption and economic uses. Deforestation, sedimentation, discharges of untreated industrial and domestic effluents into freshwater bodies and the sea, insufficiency of wastewater treatment facilities, and diffuse nitrogen and ammonia pollution from agricultural activities, all contribute to decreased water quality. By international

[1] World Bank. 2017. Turkey - Country Partnership Framework for the period FY18 - FY21. Washington, D.C.: World Bank Group.
[2] OECD. 2019. OECD Environmental Performance Reviews: Turkey 2019. Paris: OECD. Environmental pressures that have been relatively decoupled from growth in the latest review include: air emissions, energy use, waste generation and water consumption.
[3] Gökbulak, F., et al. 2018. Causes of land degradation and rehabilitation efforts of rangelands in Turkey. Forestist 68(2): 106-113.
[4] Çetin, S. C., et al. 2007. Global Attention to Turkey Due to Desertification. Environ. Monit. Assess. (128): 489-493.
[5] World Bank. 2017. Turkey: Forest Policy Note. Washington, D.C.: World Bank.

standards, Turkey is currently considered a water-stressed country and, with rapid population growth, is predicted to be water-scarce by 2030[6].

1.3 Project Development Objective and Results Indicators

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

The proposed project will support the GT in addressing the multitude of environmental and socio-economic challenges facing the Bolaman basin in the Eastern Black Sea and the Çekerek basin in Central Anatolia. The project will adopt an integrated landscape management approach in the targeted basins to achieve these objectives. Building on GT and the Bank's previous experience in watershed rehabilitation, this project will design a participatory planning process to consider inputs from different stakeholder groups, allowing for the coordination and integration of solutions among various government agencies, and between government and local stakeholders.

The project will address these issues through six groups of interventions: i) restoration of ecosystem functions and services; ii) promotion of sustainable land use practices and diversification of rural livelihoods; iii) construction of resilient flood and sedimentation control structures; iv) construction of resilient water and sanitation facilities; v) climate and disaster-proofing of rural road network; and vi) strengthening of institutional capacity for INRM. The three project components have been pre-identified at concept stage. The detailed project activities will be refined through the development of a feasibility study and technical assistance to identify the right mix of green and gray infrastructure in consultation with local stakeholders.

The project will also deploy integrated green and gray infrastructure solutions as both short-term and long-term responses to mitigate the risks of landslides, floods, and drought, and enhance climate resilience of the local population and ecosystems. Using Bolaman and Çekerek Basins as proof of concept, the project will set in motion a national program for landscape resilience. Component 1 will finance a variety of green and gray infrastructure measures, including afforestation, reforestation, forest rehabilitation, and small-scale erosion, flood, and landslide control works upstream; combined with resilient infrastructure systems mid and downstream for water storage, irrigation, and flood and sediment control, and rehabilitation of critical rural road segments to be climate and disaster-proofed. Component 2 will finance technical assistance for scaling-up the project approach to other priority areas and developing a national strategy or plan for landscape resilience and sustainable recovery, and the necessary institutional capacity building for implementing such strategy; as well as all related project management activities, including monitoring and evaluation and environmental and social risk management.

1.4 Project Components

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

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[6] Colak, A. H., et al. 2009. Restoration, Rehabilitation and Management of Deforested and Degraded Forest Landscapes in Turkey. Keep Asia Green Volume IV "West and Central Asia". IUFRO World Series Vol. 20-IV. Vienna.

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

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

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

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

Sub-Component 1.1: Green Infrastructure and Sustainable Livelihoods. The objective of this sub-component is to restore and maintain the health, function, and productivity of critical ecosystems and promote sustainable land uses within the target basins to improve the sustainability of the natural resource base, enhance the livelihood security of local communities, and build resilience against climate-induced hazards. This sub-component will finance a range of investments which will be planned in a participatory manner with targeted communities through the development of priority MCPs in each respective basin. Investments will include a variety of green infrastructure[7] (GI) measures, sustainable and climate-smart agricultural practices, and livelihood diversification activities to be implemented by OGM and

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

TRGM through their Regional and Provincial offices. The project will maximize the synergies among different interventions to the extent possible. GI will strengthen ecosystem services for long-term climate adaptation and mitigation co-benefits such as soil, water and sediment retention, flood and landslide risk reduction, and carbon sequestration. These benefits will help sustain productive agriculture and built resilience in the long run. GI will also provide habitats for enhanced biodiversity and generate economic benefits through nature-based tourism. Income generation and livelihood diversification for the rural poor will enhance their livelihood security and welfare, help reduce pressure on the forest ecosystems, and could contribute to reducing outward migration. Livelihood enhancement will be achieved through improvements in agricultural productivity, diversification of agricultural products, and value enhancement of selected products. Sustainable land use practices will be promoted through livelihood investments (i.e., use of greenhouses, manure management), and promotion of demonstrative climate-smart agricultural practices, while improvement in incomes and livelihood opportunities will help reduce pressure on the forest ecosystems upon which forest communities traditionally depend. This sub-component will include two parts, implemented by OGM and TGRM respectively.

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

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

(i) *Small-scale erosion, landslide, and flood control works upstream* aimed at conserving soil, reducing erosion and sedimentation, mitigating landslides, and decreasing runoff, peak flow, and magnitude of flooding downstream. Activities under this sub-project typology will include: (a) preparatory studies for design of erosion, landslide, and flood control measures; (b) soil conservation and erosion control works (i.e., terracing, revegetation, wire mesh fences, etc.); and (c) upstream flood and landslide control small works (i.e., retaining walls, etc.).

(ii) *Forest rehabilitation and sustainable management* activities aimed at protecting, restoring, and maintaining the health and functionality of basin forests to deliver critical ecosystem services, including soil cover protection, erosion prevention, water retention and regulation, climate adaptation (i.e., buffering against floods and extreme events) and mitigation (i.e., carbon sequestration). Activities supported under this sub-project typology include: (a) afforestation and reforestation; (b) forest rehabilitation; (c) maintenance of young forests; (d) production of saplings; (e) production of non-timber forest products; (f) establishment of small facilities for enhancing the ecotourism potential of the target basins; and (g) support, through matching grants, for the adoption of alternatives to fuelwood for cooking and heating (i.e., solar energy heating systems and roofing and insulation materials) in order to reduce pressure on forest resources.

(iii) *Forest pasture rehabilitation and sustainable management* activities aim at improving the health, carrying capacity, and productivity of pastures in and adjacent to forest lands upstream to support forest communities' livestock farming in a productive and sustainable way. Healthy pastures will also help reduce methane emissions, improve carbon pools, minimize soil erosion, improve water retention upstream, and reduce runoff downstream. Activities under this sub-project typology include: (a) grazing land rehabilitation and management (i.e., restoration of degraded pasture lands, rotational grazing, etc.); and (b) establishment of small facilities for livestock welfare and productivity.

(iv) *Income generation and livelihood diversification for forest villages* aims at creating new income-generating opportunities to directly enhance the livelihood security for poor forest communities and reduce the pressure on forest ecosystems upon which these communities traditionally depend. During the participatory MC planning process, beneficiaries will select options from a range of income-generating activities which were pre-identified through the stakeholder engagement process during project preparation. These activities will be supported on a cost-sharing basis through small matching grants, including: (a) horticulture (i.e., cultivation of alternative high value products such as truffle and berries); (b) animal husbandry (i.e., small scale high-yield cattle and dairy cattle breeding and farming); (c) sustainable apiculture; and (d) women-led enterprises in forest villages.

1.1.B. Sustainable and climate-smart agricultural value chains. This sub-component will be implemented by TRGM. It aims to improve livelihood opportunities for rural communities through the promotion of sustainable and climate-smart agricultural practices and enhancement of selected value chains in targeted basins. Diversifying livelihoods and promoting sustainable and climate-smart agricultural production will help protect the natural resource base, improve farm productivity, and strengthen communities' adaptation and resilience capacity. Agricultural value chain investments will help boost the marketability and value of select local products. Sub-project typologies include:

(i) *Sustainable and climate-smart agricultural practices* aimed at reducing soil erosion, conserving water, and enhancing nutrient capture to improve farm productivity and minimize harmful agricultural runoff. Activities will be tailored to the specific conditions of each basin and guided by sustainability and climate-smart criteria. Activities supported under this sub-project typology include: (a) preparatory studies for soil management; (b) dissemination of high quality and climate-resilient seeds; and (c) matching grant support for the promotion of cultivation techniques for soil health and water retention, Good Agricultural Practices for selected crops, and small water-efficient irrigation systems. The project will not implement such measures on a massive scale; rather, it will aim to have a demonstrative effect to encourage and facilitate land users themselves to adopt more productive and protective land management systems across the basins.

(ii) *Pasture rehabilitation and sustainable management outside forest lands.*[8] As in the case of forest pastures above, activities under this sub-project typology will support improvements in: (a) grazing land rehabilitation and management; combined with (b) establishment of small facilities to enhance livestock welfare and productivity (i.e., animal sheds with feed storage, caregiver houses, and livestock drinking water systems, etc.). These investments will help improve the resilience of livestock systems, as well as the productivity, carrying capacity, and climate mitigation potential of rural

[8] In accordance with the Pasture Law No. 4342, OGM carries out rehabilitation activities in the pasture lands inside and adjacent to forests, while TRGM is responsible for pasture lands outside forests.

pasture lands by increasing fodder quantity and quality, reducing methane emissions, improving carbon pools, minimizing soil erosion, and providing a sustainable resource base for the activities supported under the following sub-project typology.

(iii) *Agricultural diversification and sustainable value chains for rural villages,* aimed at promoting income diversification of poor rural communities outside forest areas and enhancing the performance of selected value chains suitable for the selected basins. These activities will be supported on a cost-sharing basis through small matching grants, including: (a) supporting enhanced production and market linkages of existing value chains, such as cattle/dairy cattle (e.g., via improved breeds, application of good animal husbandry practices such as improved animal health services, on-farm manure management, etc.); hazelnuts (e.g., via improved postharvest drying process to reduce spoilage and enhance quality and value); and beekeeping (e.g., via enhanced quality production and product differentiation), among others; (b) expanding opportunities for income diversification in new products/markets, for example, via cultivation and strengthening market linkages for high value products such as truffles, persimmon, dates, mushrooms, fruits, etc.; (c) supporting women-led enterprises in rural areas to enhance product quality and support product differentiation in the market place; and (d) support for youth employment initiatives in the agricultural sector. By helping rural communities diversify livelihoods vulnerable to climate change impacts, these investments will also help build their adaptation and resilience capacity.[9]

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

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

(i) *Dams and small-scale multipurpose reservoirs* will store and protect surface water sources and ensure the availability of water during low precipitation months and periods of seasonal droughts to enable the supply of drinking and irrigation water. The reservoirs will contribute to preserving and increasing groundwater reserves through reduced groundwater extraction. Depending on the location, reservoir capacities, and

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

flood peaks, the reservoirs will have multiple functions, such as stream flow control to prevent and minimize flooding incidents.

(ii) *Irrigation works*, including small irrigation ponds and irrigation systems, will supply water to support agricultural activities in targeted basins with drought and/or water scarcity problems. The availability of irrigation water will help local communities in these basins adapt to current and future climate change impacts and improve their agricultural productivity and farm incomes. Irrigation technologies employed will be drip and low-pressured springkler systems, which will save both water and energy, and hence will be more efficient and cost-effective.

(iii) *Flood and sedimentation control structures* downstream will prevent and mitigate the impacts of floods, which have caused loss of life and significant damages to local infrastructure, properties, and agricultural assets, and are even more damaging with landslides occurring during periods of heavy precipitation. Flood and sediment control structures will include check dams, levees, retaining walls, embankments, culverts, bridges, concrete channels, grouted riprap, and stream bed rehabilitation, among others. Specific locations will be determined through hydraulic modeling, historical flood records, flood risk mapping, and other relevant analysis.

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

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

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

Sub-Component 2.1: Implementation Framework for Integrated Landscape Management. The aim of this sub-component is to support the development of a national strategy for landscape resilience and sustainable recovery for vulnerable rural areas, and the necessary institutional framework and capacity building to support its implementation. The implementation framework for integrated landscape management will prioritize, guide, and facilitate landscape restoration and integrated NRM, sustainable livelihood support, and resilience and adaptation building activities in rural areas vulnerable to climate and disaster risks. Activities under this component will include: (i) support for the establishment of the implementation framework for Integrated Landscape Management, including the development and adoption of a national strategy for landscape resilience and sustainable recovery in vulnerable rural areas and the associated regulatory mechanism for institutional coordination; (ii) technical assistance for the development of guidelines to support the implementation of the national strategy for landscape resilience, including for the design of integrated planning tools at the landscape level combining green and gray infrastructure solutions (ILMPs, Micro-catchment Plans-MCPs, and others); (iii) assistance for the development of ILMPs and MCPs for the BRB and CRB; and (iv) capacity building and awareness raising for relevant institutions, local authorities, and rural communities for the application of sustainable landscape management practices, including on dam safety issues.

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

The eligible sub-projects with corresponding project component and sub-component are given in

Table 1-1 below.

Table 1-1. Project Components and Eligible Sub-Projects

Project Components	Implementing Agency (IA)	Basin
Component 1: Investments in Resilient Landscape Integration in targeted areas		
Sub-Component 1.1. Green infrastructure and sustainable livelihoods		
(a) Forest landscapes and livelihoods upstream		
(i) Small-scale erosion, landslide, and flood control works upstream	OGM	Bolaman
(ii) Forest rehabilitation and sustainable management		
(iii) Forest pasture rehabilitation and sustainable management		Çekerek
(iv) Income generation and livelihood diversification for forest villages		
(b) Sustainable and climate-smart agricultural value chains		
(i) Sustainable and climate-smart agricultural practices	TRGM	Bolaman
(ii) Pasture rehabilitation and sustainable management outside forest lands		
(iii) Agricultural diversification and sustainable value chains for rural villages		Çekerek
Sub-Component 1.2. Resilient grey infrastructure		
(a) Resilient infrastructure for water security		
(i) Dams and small-scale multipurpose reservoirs	DSI	Bolaman
(ii) Irrigation works		
(iii) Flood and sedimentation control structures		Çekerek
(b) Resilient mobility		
(i) Resilient rural road rehabilitation	KGM	Bolaman
Component 2: Institutional Framework, Project Management, and Sustainability		
Sub-Component 2.1: Implementation Framework for Integrated Landscape Management		
(i) Support for the establishment of implementation framework	OGM	
(ii) Technical assistance for the development of guidelines to support the implementation of the national strategy for landscape resilience		
(iii) Assistance for development of ILMPs and MCPs for BRB and CRB		
(iv) Capacity building and awareness raising		
Sub-Component 2.2: Project management and sustainability		
(i) Strengthening capacity for day-to-day project management	OGM	
(ii) Environmental and social risk management		
(iii) Grievance redress, citizen engagement and communications		
(iv) M&E		

1.5 Management Structure for Project Implementation

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

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

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

Central-level PIUs will also be established in each of the other IAs (TRGM, DSI, KGM) and will be in charge of Ankara-based project activities, including the preparation of IA-specific project AWPBS and coordination with their respective regional and/or provincial directorates. Each central-level PIU will be responsible for the implementation of project activities under their respective sub-components. They will coordinate with their respective regional or provincial Directorates for the implementation of project activities at the basin level, including procurement processes as needed. Central-level PIUs will report to the PCU periodically on the realization of relevant project targets and achievement of outputs. Each IA will assign a Project Focal Point acting as Head of its PIU, and will assign dedicated staff on fiduciary, E&S, and M&E issues, as well as on other technical aspects as needed. The composition and ToRs of the PIUs will be further specified in the POM.

Basin-Level Implementation Arrangements. Activities at the basin level will be implemented by the Regional and/or Provincial (in the case of TRGM) Directorates (RD/PD) of each IA and their respective Field Offices (FO). The project will be implemented in two different basins, within the borders of five provinces (Ordu, Tokat, Yozgat, Sivas, and Çorum). Thus, the project will be executed in three Regional Directorates of OGM (Giresun, Amasya, Kayseri), four Regional Directorates of DSI (Samsun, Kayseri, Sivas, Ankara), one Regional Directorate of KGM (Samsun), and five Provincial Directorates of TRGM (Ordu, Tokat, Yozgat, Sivas and

Çorum). Each RD/PD will have dedicated staff assigned by each IA to support project implementation through a Regional Implementation Unit (RIU). To further enhance the capacity for implementation in the field and ensure effective coordination among RDRD/PDs, two Regional Support Teams (RSTs) will be established under two Regional Directorates of OGM at the basin level. The physical location of the Bolaman RST will be in the Ordu Province and the Çekerek RST will be located in the Yozgat Province. RSTs will include both staff and specialized consultants to strengthen the technical and administrative capacity of the IAs at the basin level. The composition and functions of the RDs/PDs and RSTs will be further specified in the POM, taking into consideration a flexible structure adaptable to the project needs during implementation.

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

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

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

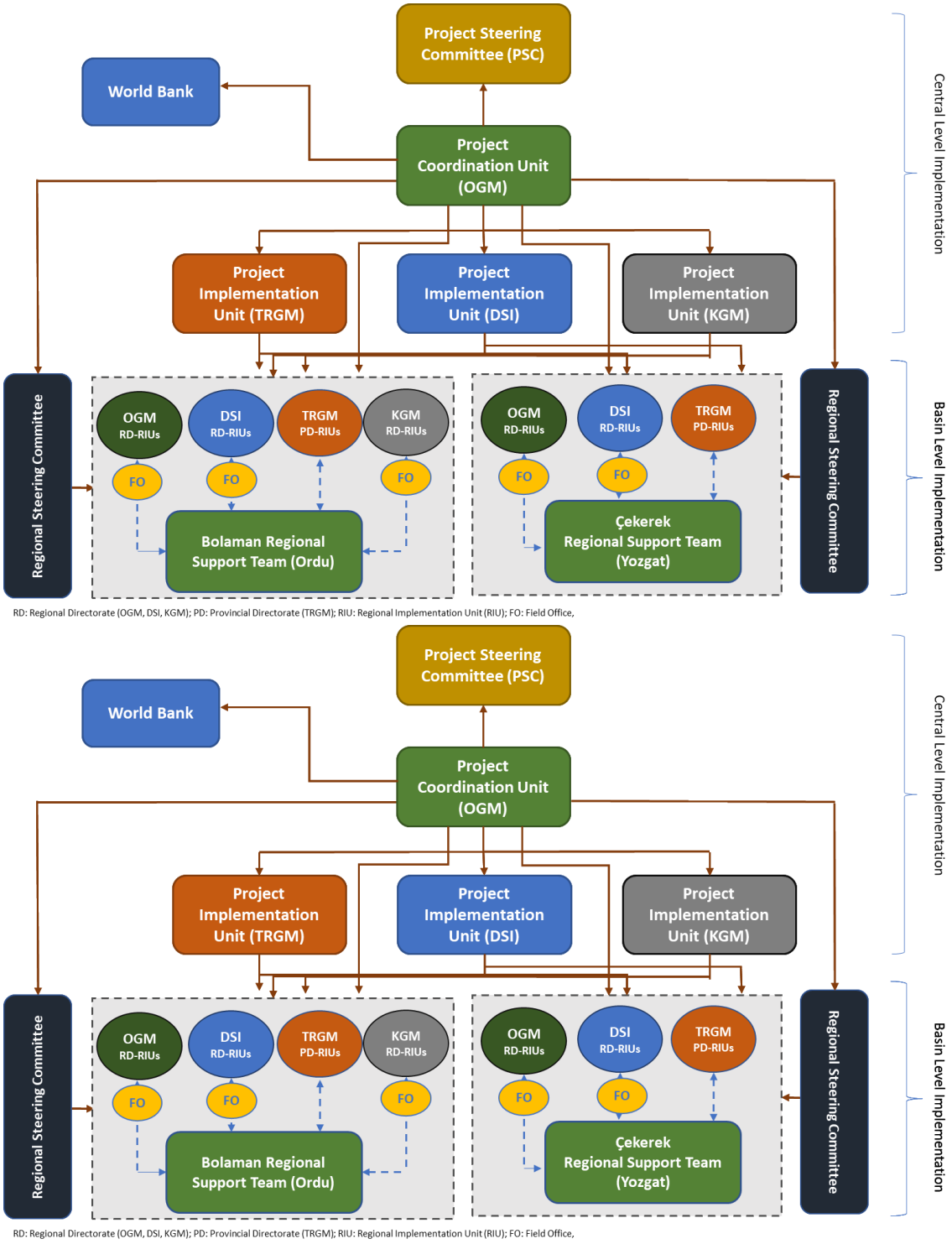

Figure 1-1 Project Implementation Structure

Please see Section 6.1 for institutional arrangements for implementation of the Environmental and Social Management Framework (ESMF), in line with arrangements for the overall project management described above.

1.6 Purpose of the ESMF

In accordance with the World Bank's Environmental and Social Framework (ESF), the ESMF sets out the principles, guidelines, and procedures to assess environmental and social risks, and proposes measures to reduce, mitigate, and/or offset potential adverse environmental and social impacts and enhance positive impacts and opportunities of projects, activities, policies and /or regulations. ESMF is geared to provide an environmental and social guidance for the investments under the Project, and also defines implementation arrangements and institutional responsibilities.

The ESMF is in compliance with both the WB ESF and the national legal framework for environmental and social management. The ESMF is the key document committed by IAs, referred as IAs and comprised of DSI, KGM, OGM and TRGM, to comply with national legislation and WB's ESF and to be shared and consulted with stakeholders before the project implementation starts.

The ESMF forms the scope of the comprehensive environmental and social management approach that has been adopted for identifying and addressing the potential environmental and social impacts of the Project.

Specifically, the ESMF:

- contains measures and plans to reduce, mitigate and/or manage adverse risks and impacts to be applied and detailed through sub-project preparation and implementation to ensure that environmental and social issues are systematically addressed at the sub-project stage;
- establishes procedures for the E&S screening, review, approval, and implementation of activities;
- specifies institutional arrangements, responsibilities and capacity building needed to successfully implement the provisions of the ESMF;
- addresses mechanisms for public consultation and disclosure of project documents as well as summarizes the stakeholder engagement and grievance mechanism which are detailed in a standalone Stakeholder Engagement Framework (SEFF); and
- integrates the Labor Management Procedures (LMP) to address labor risks associated with the project.

2 LEGAL AND POLICY FRAMEWORK

2.1 Legal Framework for Environmental Protection and Conservation in Turkey

The Turkish Environmental Law (No: 2872) is the primary legislation governing environmental issues. The Law aims to protect and improve the environment which is the common asset of all citizens; make better use of, and preserve land and natural resources in rural and urban areas; prevent water, land and air pollution; by preserving the country's vegetative and livestock assets and natural and historical richness, organize all arrangements and precautions for improving and securing health, civilization and life conditions of present and future generations in conformity with economic and social development objectives, and based on certain legal and technical principles.

Some of other laws that also include provisions pertaining to protection and conservation of the environment, protection of natural resources, conservation of cultural and natural assets, the prevention and control of pollution, safeguarding of health and safety and labor issues are:

- 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)

In line with the Environmental Law and other supplementary laws, several regulations, communiqués and ordinances have been published since 1983. Most of them have been revised recently to be harmonized with the European Union (EU) Directives in the scope of pre-accession efforts of Turkey.

Regulations listed below set the management principles, rules, standards, preventive and protective measures as well as permits required to achieve the objectives defined by the Environmental Law and other complementary laws relevant to the Project. Implementation of the policy, standards and measures stipulated by these laws and regulations are registered and committed during national EIA process. Monitoring of the implementations are guaranteed and followed by the Regulation of Environmental Permit and Licenses (Official Journal date: November 25, 2014 and No: 29186) and Environmental Auditing Regulation (Official Journal date: November 21, 2008 and No: 27061). Projects, which are exempt from EIA Regulation, are monitored by Provincial Directorate of Environment and Urbanization. Monitoring of labor and working conditions related issues are performed by Ministry of Family, Labor and Social Services in accordance to the Labor Law (Law No: 4857, Date of Ratification: 2003) and relevant regulations. Most common regulations potentially used during the implementation of the sub-projects are presented in Table 2-1 below.

Sub-projects planned under TULIP are required to comply with pertinent Turkish environmental regulations related with the possible impacts and risks imposed by activities.

Table 2-1. Regulations Applicable to Sub-projects and Respective Implications

Legislation	Official Journal Date	Official Journal Issue	Implications for the Project
Water Pollution Control Regulation	31.12.2004 10.01.2016	25687 29589	Management and discharge of wastewater generated during construction and operation stages.
Waste Management Regulation	02.04.2015	29314	Management and disposal of wastes generated during the construction and operation stages
Regulation on Landfill of Wastes	26.03.2010 11.03.2015	27533 29292	Disposal of wastes
Waste Oil Control Regulation	30.07.2008 05.11.2013	26952 28812	Management of waste oils generated at construction and operation stages
Waste Vegetable Oil Control Regulation	06.06.2015	29378	Management of waste vegetable oils generated at construction and operation stages
Packaging Waste Control Regulation	24.08.2011	28035	Management of packaging wastes generated at construction and operation stages
Medical Waste Control Regulation	25.01.2017	29959	Management of medical wastes generated at construction and operation stages
Regulation on the Control of End-of-life Tires	25.11.2006 11.03.2015	26357 29292	Management of end-of-life tires generated at construction and operation stages
Regulation on the Control of Waste Batteries and Accumulators	31.08.2004 23.12.2014	25569 29214	Management of waste batteries and accumulators generated at the construction and operation stages
Regulation on the Noise Emission in the Environment from Equipment for Outdoor Use	30.12.2006	26392	Management of noise sources used during construction and operation stages. Noise limits and standards
Regulation on Assessment and Management of Environmental Noise	04.06.2010 18/11/2015	2760129536	Management of ambient noise Ambient noise standards Modelling requirement
Industrial Air Pollution Control Regulation	03.07.2009 20.12.2014	27277 29211	Management of air emission sources during construction and operation stages. Dust emission control at the construction stage and SO2, NOx and Dust emission control at the construction stage Emission monitoring
Regulation on Assessment and Management of Air Quality	06.06.2008	26898	Management of ambient air quality. Ambient air quality standards Modelling Requirement
Regulation on the Control of Odorous Emissions	19.07.2013	28712	Management of Odorous emissions during the operation stage.
Regulation on Soil Pollution Control and	08.06.2010 11.07.2013	27605 28704	Risks of soil contamination at construction and operation stages

Legislation	Official Journal Date	Official Journal Issue	Implications for the Project
Point Source Polluted Areas			Remediation of contaminated sites
Regulation on the Control of Excavation Soil, Construction and Debris Wastes	18.03.2004	25406	Transportation and disposal of excavation waste and construction debris at the construction stage
Law on Occupational Health and Safety (6331)	20.06.2012	28339	Health and safety measures to be taken during construction and operation stages
Regulation on Buildings to be Constructed within the Seismic Zones	06.03.2007 03.05.2007	26454 26511	Building safety.
Regulation on Environmental Permits and Licenses	10.10.2014	29115	Environmental permit requirement for operation phase Air emission permit Noise permit Wastewater discharge permit Other permits such as Permit for temporary storage of wastes, Permit for Interim storage of wastes etc.
Environmental Auditing Regulation	21.11.2008	27061	Implementation and monitoring of measures stipulated EIA Report. Monitoring of the operation of the facilities in terms of environmental legislation regarding laws and regulations.
Regulation for Starting up and Operating a Workplace	10.09.2005	25902	Operation of facilities.
Expropriation Law No. 2942 (as amended with the Law numbered 6645) and relevant regulations	08.11.1983 23.04.2015	18215	Expropriation of private properties
Pasture Law No. 4342 (as amended with the Law numbered 6552) and relevant regulations	28.02.1998 14.04.2016	23272	Permission(s) required for land use
Law on Soil Conservation and Land Use No. 5403 (as amended with the Law numbered 6537) and relevant regulations	19.07.2005 15.05.2014	25880	Permission(s) required for land use
Law on Aquaculture Resources No. 1380 (as amended with the Law numbered 5996) and relevant regulations	04.04.1971 13.12.2010	13799	Permission(s) required for land use
Regulation on the Protection of Water Against Agricultural	23.07.2016	29779	Prevention, reduction and elimination of pollution of water resources from agricultural nitrate application.

Legislation	Official Journal Date	Official Journal Issue	Implications for the Project
Based Nitrate Pollution			

The permits and licenses to be obtained specifically for the sub-projects will be determined at the preparation of the site-specific ESA documents. However, an indicative list of the potential licenses and permits that may be required for the sub-projects are listed below:

- EIA decision,
- Construction permit,
- Environmental permit on wastewater discharge, air emissions, waste management,
- Operation license,
- License to process/dispose wastes,
- Construction license, and
- Temporary certificate of operation.

2.2 The Turkish Regulation on EIA

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

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

Screening

The EIA Regulation classifies projects into two categories:

Annex I projects. These are projects that have significant potential impacts and require a full EIA. Annex I of the EIA Regulation lists these projects types, so project proponents are expected to start the EIA procedure without any other screening process; and

Annex II projects. Annex II of the EIA regulation covers the projects that may or may not have significant effects on the environment. Proponents of Annex II projects are required to submit a Project Information File (PIF) to the Ministry of Environment and Urbanization (MoEU). The PIF is prepared following the General Format for PIF provided in Annex IV of the EIA Regulation and contains information on: (i) project characteristics; (ii) environmental characteristics of the project site and impact area; and (iii) significant impacts of the project and measures to be taken during construction and operation phases of the project. A non-technical summary of the above items is also to be added to the PIF. The PIF is submitted to

the MoEU for review and evaluation. Provincial Directorate gives its “EIA is Necessary” or “EIA is not necessary” decision regarding the project. The decision of the Provincial Directorate is communicated to public using appropriate means (i.e. announcement boards, internet).

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

Public Consultation

For projects that require the preparation of an EIA, the Governorate is required to inform the public that a project application has been submitted in a specified locality, that the EIA process has begun and that the public may submit its comments and suggestions to the Governorate or MoEU. The announcement is made using a variety of methods, including the internet, bulletin boards and loudspeaker announcements. MoEU informs the public of the same through the internet.

A formal public consultation meeting occurs for projects that are subject to an EIA after the screening process and prior to scoping. The project proponent organizes a “public participation meeting” chaired by MoEU provincial director in a location that affected local groups can access easily. The invitation to the meeting is published in a national and a local newspaper at least ten days prior to the meeting. There is no requirement that information on the project should be provided to the public in advance, except for the subject matter of the meeting. However, the EIA Regulation specifies that during the meeting, which is chaired by the Director or a member of MoEU’s provincial directorate, it should be ensured that the public is informed about the project, and its comments and suggestions regarding the project are obtained. The meeting chairperson may request comments in writing too. Minutes of the meeting are kept and submitted to MoEU and the Governorate. The Governorate is required to inform the public about the timeframe for submission of public comments and suggestions. Such comments and suggestions are submitted to the EIA commission.

Scoping

The project proponent presents a project dossier (using the outline given in Annex III of the EIA regulation for Annex I projects) to a commission, which comprises representatives of MoEU and relevant organizations as identified by MoEU. Based on the information submitted, the commission determines the scope of the EIA and the “project specific format”. Furthermore, the commission may exclude or include some items depending on the specific characteristics of the proposed project. The commission also determines the level of detail under each heading depending on the special project’s environmental impacts. In this process, the commission takes into consideration of the opinions expressed during the public participation meeting.

Review and Approval of the EIA Report

As mentioned previously, the commission revises the draft version of the EIA report. In its review, the commission assesses (i) the adequacy of the EIA report and its annexes; (ii) whether the analyses, evaluations or calculations were adequately substantiated by relevant data and documentation; (iii) whether the potential environmental impacts of the project were evaluated in adequate scope and depth; (iv) whether measures necessary to prevent or mitigate negative environmental impacts have been identified; (v) whether the public participation meeting was carried out in accordance with prescribed procedures and the issues brought up during the meeting were adequately addressed in the report. While the EIA identifies a project’s environmental impacts and mitigation measures, it does not specify costs and institutional responsibilities associated with these mitigation measures. Neither does the EIA include a monitoring plan.

The final EIA report, which incorporates the commission's assessments, is then submitted to the MoEU for final review. MoEU determines whether the "EIA is positive" in which case the project proponent may implement the project or "EIA is negative" in which case the project may not go any forward.

Disclosure

The draft EIA report is made available to the public for comments at Central MoEU or provincial directorate. After MoEU's final evaluation of the EIA report, the Governorate announces to the public MoEU's decision together with its justifications. Disclosure of the final EIA document is not foreseen in the EIA Regulation.

Monitoring and Inspection

According to the EIA Regulation, MoEU monitors and inspects projects that were assessed either "EIA is not necessary" or "to have a positive EIA" based on provisions specified in the PIF or the EIA, respectively. Furthermore, the project proponent is obliged to submit project progress reports to MoEU. In case MoEU determines non-compliance, the Governorate issues a warning. If after the granted time compliance is still not achieved the Governorate may suspend the operation of the plant in question.

National Laws on Social Impacts

Although the Turkish EIA Regulation does not entirely meet the requirements of international standards in terms of social impacts and stakeholder engagement, there are some legal arrangements for managing various social impacts. In this respect, the following are identified to be a non-exhaustive list of social legal framework applicable for this project:

- Labor Law (No. 4857), published in the Official Journal no. 25134 dated 10 June 2003
- Law on Occupational Health and Safety (No. 6331), published in the Official Journal no. 28339 dated 30 June 2012
- Regulation on Contractors and Sub-contractors, published in the Official Journal no. 27010 dated 27 September 2008
- Laws on Right to Information (No. 4982), published in the Official Journal no 25269 dated 24 October 2003
- Regulation on the Environmental Impact Assessment (EIA) published in the official Journal no. 29186 dated 2525 November 2014

In terms of land acquisition and involuntary resettlement, the relevant legal arrangements of Turkey are summarized below:

- Expropriation Law, published in the Official Journal no. 18215 dated 8 November 1983
- Amendment to the Expropriation Law published in the Official Journal no. 24393 dated 5 May 2011.

Occupational Health and Safety

In recent years, Turkey has undergone a reform to improve its national Occupational Health and Safety (OHS) system through adapting a set of international and regional standards into its national level requirements for the prevention occupational risks as defined in the International Labor Organization (ILO) Occupational Safety and Health Convention, 1981 (No. 155). The convention, along with the Occupational Health Services Convention, 1985 (No. 161) were both ratified by Turkey in 2005 who Turkey is also party to the Labor Inspection Convention, 1945 (No. 81) since 1951. In 2014, Turkey ratified the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187).

During 2012, a stand-alone Law on OHS (No. 6331) was put into force (20 June 2012). The OHS Law governs workplace environments and industries (both public and private) as well as virtually all classes of employees including part-time workers, interns, and apprentices. The legislation is comprehensive and is generally applicable across all sectors and many industries.

Labor and Working Conditions

Turkey is party to a multitude of International Labor Organization (ILO) conventions, including but not limited to conventions on equal treatment of employees, gender equality, child labor, forced labor, OHS, right of association and minimum wage. Accordingly, the current Turkish Labor Law (No.4857) is to large extent consistent with ESS2 requirements.

There is also secondary legislation that may apply to the project which include regulations on annual leave, working hours, overtime work, minimum wage, female and child employees and forced labor. The Ministry of Family, Labor and Social Services (MoFLSS) has published various communiques and circulars that set ground for the implementation of the Labor Law which may also be referenced during project implementation.

International Agreements and Conventions

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

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

- Paris Convention on the Protection of the World Cultural and Natural Heritage (ratified on 16.03.1983)
- Ramsar Convention on Wetlands of International Importance Especially as Wildfowl Habitat (ratified on 13.11.1994)
- Stockholm Convention on Persistent Organic Pollutants (ratified on 30.07.2009)
- United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (ratified on 16.05.1998)
- United Nations (UN) Framework Convention on Climate Change (Kyoto Protocol) (ratified on 28 May 2009)
- UN (Rio) Convention on Biological Diversity (ratified on 11.06.1992)
- Vienna Convention 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 (ratified on 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)

2.3 World Bank's Environmental and Social Standards

2.3.1 Brief Description of World Bank Environmental and Social Standards

The World Bank 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, the Bank has formulated an Environmental and Social Framework (ESF) comprising specific 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 Environmental and Social Standards (ESSs) to projects supported through Investment Project Financing in accordance with this Environmental and Social Policy for Investment Project Financing (Policy). World Bank ESSs are briefly described in Table 2-2 below. ESSs 1 to 6, ESS 8 and ESS 10 are relevant to the Project.

Table 2-2. Brief Description of World Banks ESSs

ESS	Topic	Brief requirement
ESS 1	Assessment and Management of Environmental and Social Risks and Impacts	The Borrower will carry out an environmental and social assessment of the project to assess the environmental and social risks and impacts of the project throughout the project life cycle. The assessment will be proportionate to the potential risks and impacts of the project, and will assess, in an integrated way, all relevant direct, indirect and cumulative environmental and social risks and impacts throughout the project life cycle, including those specifically identified in ESSs 2–10.
ESS 2	Labor and Working Conditions	The Borrower will develop and implement written Labor Management Procedures applicable to the project. These procedures will set out

ESS	Topic	Brief requirement
		the way in which project workers will be managed, in accordance with the requirements of national law and this ESS.
ESS 3	Resource Efficiency and Pollution Prevention and Management	The Borrower will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention measures in accordance with the mitigation hierarchy. The measures will be proportionate to the risks and impacts associated with the project and consistent with Good International Industry Practice, in the first instance the WB Environmental, Health and Safety Guidelines. 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.
ESS 4	Community Health and Safety Annex 1 – Safety of Dams	The Borrower will evaluate the risks and impacts of the project on the health and safety of the affected communities during the project life cycle, including those who, because of their particular circumstances, may be vulnerable. The Borrower will identify risks and impacts and propose mitigation measures in accordance with the mitigation hierarchy. The Borrower will hire Independent Dam Safety Panel of Expert (POE) comprising three or more experts, based on the Terms of References (TOR) approved by the Bank, with expertise in the various technical fields relevant to the safety aspects of the particular dams. The Borrower will ensure the POE review and advise on matters relative to dam safety and other critical aspects of the dams, their appurtenant structures, the catchment area, the area surrounding the reservoir, and downstream areas for investigation, design and construction of the dams and the start of operations. The POE will be established one month prior to the start of the feasibility studies and retained until at least the filling of all the reservoirs and start-up of the dams. The Borrower will prepare dam safety plans for the dams based on requirement on quality and timing in the ESF including: (i) Construction Supervision and Quality Assurance Plan (CSQAP); (ii) Instrumentation Plan (IP); (iii) Operation and Maintenance Plan (O&MP); and (iv) Emergency Preparedness Plan (EPP). The Borrower will develop and implement training on dam safety management in order to improve DSI's capacity on dam safety management. For large dams that are 15 meters or more in height, the owner has full responsibility for the safety of the dam, hence the Bank requires 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; prequalification of bidders during procurement and bid tendering, and periodic safety inspections of the dam after completion.
ESS 5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	The Borrower will demonstrate that involuntary land acquisition or restrictions on land use are limited to direct project requirements for clearly specified project purposes within a clearly specified period of time. The Borrower will consider feasible alternative project designs to avoid or minimize land acquisition or restrictions on land use, especially where this would result in physical or economic dis-placement, while balancing environmental, social, and financial costs and benefits, and paying particular attention to gender impacts and impacts on the poor and vulnerable.
ESS 6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	The environmental and social assessment as set out in ESS1 will consider direct, indirect and cumulative project-related impacts on habitats and the biodiversity they support. This assessment will consider threats to biodiversity, for example habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, pollution and incidental take, as well as projected climate change impacts. It will determine the significance of biodiversity or habitats based on their vulnerability and irreplaceability at a global, regional or national level and will also take

ESS	Topic	Brief requirement
		into account the differing values attached to biodiversity and habitats by project-affected parties and other interested parties.
ESS 7	Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	This ESS applies whenever Indigenous Peoples / Sub-Saharan African Historically Underserved Traditional Local Communities are present in, or have collective attachment to a proposed project area, as determined during the environmental and social assessment.
ESS 8	Cultural Heritage	The Borrower will avoid impacts on cultural heritage. When avoidance of impacts is not possible, the Borrower will identify and implement measures to address impacts on cultural heritage in accordance with the mitigation hierarchy. Where appropriate, the Borrower will develop a Cultural Heritage Management Plan.
ESS 9	Financial Intermediaries	Financial intermediaries will put in place and maintain an Environmental and Social Management System (ESMS) to identify, assess, manage, and monitor the environmental and social risks and impacts of sub-projects on an ongoing basis.
ESS 10	Stakeholder Engagement and Information Disclosure	Borrowers will engage with stakeholders throughout the project life cycle, commencing such engagement as early as possible in the project development process and in a timeframe that enables meaningful consultations with stakeholders on project design. The nature, scope and frequency of stakeholder engagement will be proportionate to the nature and scale of the project and its potential risks and impacts.

2.3.2 World Bank Safeguards Policies

After enactment of the ESF, environmental and social safeguard policies of the World Bank got abolished, but some remained in force. One of them is Operational Policy (OP) 7.50 - Projects on International Waterways. It describes the types of waterways and projects that the policy applies, and the requirements and conditions of financing projects on international waterways. In this respect, the waterways identified as not being international waterways and not triggering OP 7.50 in Turkey are the following: Susurluk, North Aegean, Gediz, Kucuk Menderes, Buyuk Menderes, Western Mediterranean, Antalya, Sakarya, Western Black Sea, Yesilirmak, Kizilirmak, Konya Kapali, Eastern Mediterranean, Seyhan, Ceyhan, Eastern Black Sea, Burdur, Afyon, Orta, Anadolu, and Van. The sub-projects which can potentially affect water quantity and quality other than those waterways will be ineligible for financing. Since the project location is in Eastern Black Sea, the project does not trigger OP 7.50.

OP 7.60 is also not triggered, as the Project area is not located in any disputed area.

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

The applicable World Bank Group (WBG) EHS Guidelines for the Project, depending on the specific type of sub-projects, include but are not limited to the following:

- World Bank Group's EHS General Guidelines (2007),
- World Bank Group's EHS Guidelines for Water and Sanitation (2007),

- World Bank Group's EHS Guidelines for Waste Management Facilities (2007),
- World Bank Group's EHS Guidelines for Forest Harvesting Facilities (2007),
- World Bank Group's EHS Guidelines for Annual Crop Production (2016),
- World Bank Group's EHS Guidelines for Perennial Crop Production (2016),
- World Bank Group's EHS Guidelines for Mammalian Livestock Production (2007), and
- World Bank Group's Good Practice Handbook on Environmental Flows for Hydropower Projects.

Major Differences between Turkish EIA Regulation and the WB ESSs

There are a number of differences between the Turkish EIA Regulation and the WB impact assessment procedures. Table 2-3 provides a summary of the major differences.

Table 2-3. Differences between Turkish and WB Impact Assessment Procedures

Topic	World Bank ESF provisions	National Regulation
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.
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.	Assessment is made based on an outline of contents provided by MoEU, 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 ESS 10. Continuous stakeholder engagement takes place throughout the life cycle of the project (proportionate to the nature, scale and impact magnitude of the project).	The Turkish EIA Regulation requires "pre-scoping" public consultation only for projects requiring an EIA, and only requires announcement of the environmental assessment together with the justification.

Table 2-4. Key Gaps Between WBG ESSs and Turkish E&S Legislation

WB ESSs	Gaps	ESF Documents/Study to Fill the Gaps
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	The major gaps between National EIA Regulation and ESS 1 are as follows: • Social impact assessment is not completely integrated to the Turkish EIA and this results in the absence of proper social baseline, identification and assessment of the project induced social impacts including impacts on disadvantaged or vulnerable and gender related issues, • 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.	Sub-project specific environmental and social assessment studies such as Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP) will be prepared in line with ESS1. In this respect, potential environmental and social impacts of the sub-projects will be the 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 each ESIA/ESMP.
ESS 2: Labor and Working Conditions	In general, Turkish national laws and regulations regarding labor and working conditions satisfies ESS 2 requirements. Worker grievance mechanism is the main gap between national legislative requirement and ESS 2. Per the Turkish national legislation on labor and working conditions, there is no specific requirement related to grievance mechanism that allow workers to communicate their complaints to the employer.	Labor Management Procedure (LMP) is a component of the ESF instruments. LMP provides guidance on the required mitigations or management implementations such as workers GM, code of conduct etc. stipulated by ESS2 and relevant WB EHS guidelines. In line with the LMP developed for the Project, sub-project specific Labor Management Plans (LM Plans) will be developed, as relevant.
ESS 3: Resource Efficiency and Pollution Prevention and Management	Most of the relevant national legislations regarding laws and regulations are in line with EU directives. There is no major gap between ESS3 and legislative requirements. Local EIA does not provide detailed management perspective on potential impacts, mitigation measures and residual impacts and monitoring. In other words, sub-management plans are not specifically defined in local EIA process. Additionally, the specific studies regarding resource use and pollution prevention such as Water Source Vulnerability Analysis WSVA, Green House Gas (GHG) estimations etc. are not included in local EIA Process.	Sub-management plans will be developed as part of ESIA/ESMP, for construction and operation phases of the projects. These management plans also provide requirement stipulated in relevant WB EHS Guidelines.

WB ESSs	Gaps	ESF Documents/Study to Fill the Gaps
ESS 4: Community Health and Safety	In general, there is no gap in terms of policy level. On the other hand, project level management of specific risks such as labor influx, sexual exploitation and abuse and sexual harassment (SEA/SH) are the key gaps in terms of ESS4. In relation to dam safety; despite that there is no specific legislation for dam classification and their required safety measures are available but the general requirements are identified following many laws and regulations, such as Protection against Flooding Law (1943), Civil Defense Act (1958), Measures and Assistance Regarding Natural Disasters affecting General Public Life Precautions Act (1959), DSI Regulation on Protection against Flooding (1982), The Environmental Law (1983), and Regulation on the Environmental Impact Assessment (2003). In order to eliminate the security weaknesses that may occur during the operation of water storage structures, DSI has in place guidelines "Environmental Protection, Safety and Warning Systems" for Power Generation Facilities". In line with this guide, for each storage structure operation DSI prepares an "Environmental Protection, Safety and Warning Systems Application Project" that includes safety measures against possible risks associated with construction and operation activities in storage structures.	Management plans will be prepared for the sub-projects, as relevant, as a part of ESIA/ESMP, such as: • Traffic Management Plans, • Community Health and Safety Plans, • Emergency Response and Preparedness Plans 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. The ESMP/LMP will include relevant provisions for SEASEA/SH.
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Turkish legislation on land acquisition mainly corresponds to requirements stipulated by ESS 5. However, some differences include preparation of a Resettlement Plan (RP), compensation at replacement costs, continuous consultation during RP implementation, impact assessment on informal land users, vulnerable groups and land-based livelihood restoration are the major gaps in terms of ESS 5 requirement.	The Resettlement Framework (RF) in line with this ESMF is prepared to provide a guidance to assess any risk of resettlement and to prepare sub-project specific RPs in case a requirement. Sub-project specific RPs will be prepared in order to account for the discrepancies with the national legislation. Particular concern will be given in RPs on vulnerable groups. Livelihood impacts of sub-projects on informal land users will be assessed and Livelihood Restoration Plans (LRPs) will be prepared as relevant to sub-projects.
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	There is no gap in terms of policy level. On the other hand, in some cases, level of the considerations of not legally protected sensitive ecological areas such as Key Biodiversity Areas in local EIA Process are not sustain the requirements stipulated by ESS6. Furthermore, management and monitoring of potential impacts, mitigation measures and residual impacts are not detailed in general.	Depending on the location of the sub-projects and pertinent impacts, Biodiversity Management and Action Plans can be prepared within the scope of sub-project specific ESIAs/ESMPs. Sub-projects which have significant impacts on biodiversity will be considered as ineligible.
ESS 8: Cultural Heritage	Turkish national legislation on protection of cultural assets mainly satisfies the ESS 8 requirements for physical cultural heritage	Sub-project specific environmental and social assessment will take into consideration the significance of intangible

WB ESSs	Gaps	ESF Documents/Study to Fill the Gaps
	but fails to cover intangible cultural heritage.	cultural heritage that may be materially affected or put at risk as a result of the sub-project.
ESS 10: Stakeholder Engagement and Information Disclosure	Effective and transparent stakeholder engagement is the main gap in terms of ESS10 requirement. Within this scope, a Stakeholder Engagement Plan (SEP) required to identify the different stakeholders (project-affected parties and other interested parties including disadvantaged or vulnerable). Stakeholder engagement should be a continuous and well-documented process throughout project duration.	Stakeholder Engagement Framework (SEF) is in place as part of ESF documents. Sub-project level SEPs will be prepared depending on the level of social risks and in line with the guidelines provided and structure described in the SEF. TULIP SEF will be operational throughout implementation of the Project, including an overall disclosure of information on sub-projects and the grievance mechanism.

2.4 E&S Risk Classification

The investments planned under the project will primarily have positive environmental and social impacts such as mitigating the risks of landslides, floods, and drought, and enhancing the resilience of the local population and ecosystems. On the other hand, specific sub-projects are also expected to have some adverse environmental and social risks and impacts those are related to both construction and operation phases of the investments.

The overall environmental risk is rated by the WB as ***Substantial***. The rating is determined by the nature and magnitude of green and grey infrastructural improvements considered under the project Component 1, and by the limited environmental and social management capacity of the IAs.

The overall social risk is rated by the WB as ***Substantial*** due to contextual risks associated with the project and capacity of the multiple implementing state agencies to implement the ESF. Contextual risks include child labor associated with the hazelnut production in Turkey, and the use of seasonal migrant workers in agriculture, mainly hazelnut harvesting. The relevance and significance of these risk within the project scope will be assessed during environmental and social assessment (ESA) process carried out project preparation. The proposed investments may require land acquisition and economic and physical displacement of a small scale and may generate temporary community health and safety risks and impacts, and OHS risks among civil works contractors. Labor influx risk is estimated as substantial and SEA/SH risks associated with civil works are assessed as moderate. The risk of forced labor is not expected and considered as minimal.

The construction-related impacts are mainly air and noise emissions, generation of non-hazardous wastes, community health and safety (including traffic management related risks and gender-based violence risks), occupational health and safety risks, labor influx, land acquisition, loss of livelihoods, etc. There is also a risk of adverse impacts on potential sensitive archaeological areas, which are not known and legally not registered yet.

Even though at this stage there is limited information on sub-projects' exact locations, detailed designs, source of construction materials, the proposed sub-projects and their impacts are not anticipated to be significant. The risk category of the proposed sub-projects is expected to be moderate for green investments and substantial for the grey investments, mainly the sub-projects regarding dams, multipurpose reservoirs and water storage infrastructure. Risk screening mechanism will be applied for all sub-projects. The proposed sub-projects will necessitate studies to determine and assessed site-specific risk and impacts and suggest site-

specific mitigation measures tailored to meet the project capacities and ecological and physical environmental characteristics of the project location. High risk projects are not eligible for financing within the scope of the project.

With this approach, relevant environmental and social issues associated with the construction and operation of each type of sub-project have been elaborated in the ESMF. The Resettlement Framework (RF) in line with this ESMF is prepared to provide a guidance to assess any risk of resettlement and to prepare sub-project specific Resettlement Plans (RPs) in case a requirement arises. Labor Management Procedure (LMP) is also in place for the Project. LM Plans will be prepared for each sub-project to include application of ESS 2 to the employees of the IAs in the course of project and application to project workers. Additionally, Stakeholder Engagement Framework (SEF) has been drafted to address the procedures for preparation and implementation of the Stakeholder Engagement Plans (SEPs). For all sub-projects, site specific ESA documents (e.g. ESIAs/ESMPs, if necessary, RPs) will be prepared during implementation. The associated facilities of the sub-projects as well as cumulative impacts will also be taken into consideration through preparation of site-specific ESA documents. Sub-project specific ESA documents will be approved by the World Bank and disclosed, and incorporated into the respective bidding packages before the start of the respective bidding processes of each sub-project. PCU will set the framework documents (i.e. ESMF, SEF, RF, etc.) and PIUs will produce these documents according to the E&S risk categorization of the sub-projects. PIUs will cooperate with RD/PDs and RSTs in preparation of the ESF instruments, particularly in terms of baseline conditions and engagement with local stakeholders.

Table 2-5. Project Specific Application of ESSs

ESS	Topic	Project Specific Requirement	ESF Instruments
ESS 1	Assessment and Management of Environmental and Social Risks and Impacts	PCU coordinated conduct of Strategic Environmental and Social Assessment (SESA) for each basin, for systematic examination of environmental and social risks and impacts, and issues associated with TULIP in the target project areas. PCU will coordinate with all IAs (DSI, KGM, TRGM) for conducting E&S assessment of sub-projects as per the results of screening process. Accordingly, this will be complemented with stakeholder engagement and disclosure of information in accordance with ESS10. PCU ensure monitoring and reporting on the environmental and social performance of the project against the ESSs, in accordance with the Environmental and Social Commitment Plan (ESCP).	Sub-project specific Environmental and Social Assessment studies including ESIA or ESMP will be prepared in line with ESS 1. Potential social impacts of the sub-projects will be the part of the assessment. The environmental and social assessment studies will also address impacts of the associated facilities and potential cumulative impacts. Depending on the level of the impacts, sub-management plans will be annexed to the ESIA/ESMP. Basin specific SESA Reports are in place as required by ESS 1, which include consideration of the full range of environmental and social risks and impacts incorporated in ESSs 1 through 10.
ESS 2	Labor and Working Conditions	PCU will coordinate all IAs to develop and implement project-specific Labor Management Plans. LM Plan will set the general frame for managing project workers during both construction and operation stages, including a GM for workers. The procedures will comply with the requirements of Turkish labor law	In some of the sub-projects of OGM and TRGM (i.e. young forest rehabilitation, greenhouses installation, hazelnut terracing, etc.) community labor will be hired. In the LM Plans, the labor management procedures will specify the way in which community workers can raise grievances in relation to the related sub-projects. The potential risks and

ESS	Topic	Project Specific Requirement	ESF Instruments
		and pertinent by-laws as well as ESS 2.	impacts of the activities to be conducted by community workers will be assessed in detail in the LM Plans which will be prepared by the IAs. AA Labor Management Procedure (LMP) is in place for the Project. Sub-project specific LM Plans will be prepared in line with the LMP developed for the Project.
ESS 3	Resource Efficiency and Pollution Prevention and Management	Depending on the risk categorization and screening of sub-projects, PCU will ensure that applicable sub-projects will be assessed in terms of resource efficiency including energy, water and raw material use; and pollution prevention and management including management of air pollution, hazardous and non-hazardous wastes, chemicals and hazardous materials, and pesticides. The project includes sub-projects relating to the enhancement of agricultural production and introduction of high value crops and beekeeping.	Waste Management Plans will be a significant tool for majority of sub-projects, i.e. Construction Waste and Debris Management Plan for grey projects, and Vegetable Wastes for Green Projects (greenhouses, orchard improvements, forest improvements, etc.) Dust and Noise Control Plans for all construction activities Wastewater Management Plan for Construction Activities Traffic Management Plans for the overall material transportation in all sub-projects GHG estimations for the overall project transportation Soil Contamination Control Procedures Pest Management Plan
ESS 4	Community Health and Safety	PCU will ensure that risks and impacts of projects will be assessed in terms of health and safety of affected communities during the life cycle of sub-projects. PCU will ensure that risks and impacts are identified, and mitigation measures are implemented.	Plans such as Traffic Management Plan, Community Health and Safety Plan, etc. will be prepared as part of ESIAs/ESMPs. DSI will ensure that an independent panel of experts will be established throughout investigation, design, and construction of the dam and the start of operations; detailed plans prepared and implemented; prequalification of bidders during procurement and bid tendering, and periodic safety inspections of the dam after completion.
ESS 5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	In line with the Resettlement Framework (RF), PCU will ensure that Resettlement Plans (RPs) are in place and include general requirements such as eligibility classification, project design, compensation and benefits for affected persons, full livelihood restoration, consultations with all affected households, community engagement, grievance mechanism, planning and implementation; fair	The RF in line with this ESMF is prepared to provide a guidance to assess any risk of resettlement and to prepare sub-project specific RPs in case a requirement. Livelihood Restoration Plans (LRP) will be prepared where necessary (i.e. temporary blockage of access to ecosystem services, land take for projects, abandoned use of pastures for the restoration period, etc.).

ESS	Topic	Project Specific Requirement	ESF Instruments
		and timely compensation for physical and economic displacement; collaboration with other responsible agencies or subnational jurisdictions; and technical and financial assistance.	
ESS 6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	The applicability of ESS6 depends on the environmental and social assessment described in ESS1. Based on the results of E&S Assessment to be performed for applicable projects, PCU will ensure that project-specific assessment work will include identification of risks and impacts, conservation of biodiversity and habitats (modified, natural, and critical habitats), legally protected and internationally recognized areas of high biodiversity value, invasive alien species, and sustainable management of living natural resources.	Depending on the location of the sub-projects and pertinent impacts, Biodiversity Management Plans will be annexed to the ESIA/ESMP. There will be no investments on the critical habitats.
ESS 8	Cultural Heritage	The applicability of ESS8 depends on the environmental and social assessment described in ESS1. PCU will coordinate with all IAs to ensure that a Chance Find Procedure is in place and is complied by construction companies and their sub-contractors.	Chance Find Procedure should be annexed to all sub-contract agreements with construction contractors. There will be no investments on culturally sensitive areas.
ESS 10	Stakeholder Engagement and Information Disclosure	ESS10 applies to all sub-projects. In line with the Stakeholder Engagement Framework (SEF) prepared for the Project, the PCU will be required to coordinate with IAs and their PIU so as to ensure development of a Stakeholder Engagement Plans (SEPs) for all sub-projects information disclosure and meaningful consultation; engagement during project implementation and external reporting; and grievance mechanism; and organizational capacity and commitment.	SEF for the Project is in place and is a part of the ESF documents. SEF suggests particular engagement methods for each stakeholder group. According to the SEF, subs-project level SEPs will be prepared depending on the level of social risks. SEF and the SEPs will be operational throughout implementation of the Project, including an overall disclosure of information on sub-projects and the grievance mechanism.

3 INSTITUTIONAL FRAMEWORK

Basin management policies are centrally planned in Turkey. The governmental organizations undertake the planning, development, management, maintenance, and monitoring and evaluation of programs related to river basin management. The local authorities are involved at the stage of implementation and non-governmental organizations are also indirectly involved in many activities. Direct stakeholders of basin management and their main responsibilities in relation to basin management as well as institutional responsibilities of them within the Project are indicated in Table 3-1 below.

Table 3-1. Governmental Stakeholders for Basin Management

Organization	Main Tasks and Responsibilities	Institutional Responsibilities within the Project
Ministry of Environment and Urbanization (MoEU)	Pollution prevention in water resources Overall coordination of environmental policies Approve and ensure environmental plans Ensure implementation of EIA By-law Ensure harmonization with EU acquis Regulate classification of water resources per quality parameters Issue permits and monitor wastewater discharges Review and approve treatment plant projects Ensure protection plans are in place for water resources Coordinate and set the regulatory frame related with climate change Coordinate and monitor climate change action plans, Set policies for adaptation to climate change	Review and approval of SESA for Bolaman Basin Management Plan, if required Review and approval of EIAs and/or PIF for sub-components during implementation as per national legislation Providing permits to the treatment plants
General Directorate of Forestry (OGM)	Protection, maintenance and sustainable management of forests and forest connected pastures, afforestation and reforestation, restoration of riparian ecosystems and stream corridors Erosion and sedimentation control, upstream natural water retention and storage, land slide and flood control work Income generation and livelihood diversification activities for forest communities, such as beekeeping, non-timber forest products, and ecotourism services. Integration of the socio-economic dimensions and provision of services to upland communities	Leading and coordinating agency of the Project Implementation of Sub-Components 1.1.A, 2.1 and 2.2. Preparing and ensuring implementation of the ESIAs, ESMPs, SEPs, RPs and LM Plans on site as relevant to its project activities, and to carry out pertinent M&E activities. Receiving and processing complaints in accordance with Grievance Mechanism Reporting to the WB on quarterly basis on E&S compliance and monitoring
General Directorate of Agricultural Reform (TRGM)	Improving the quality of life and economic diversity in rural areas Collecting agricultural data and generating statistics Increasing productivity in agricultural irrigation Carrying services related to global climate changes, agricultural environment,	Implementation of Sub-Component 1.1.B including planning, procurement, contract management, supervision, and financial management Preparing and ensuring implementation of the ESIAs, ESMPs, SEPs, RPs and LM Plans on site, as relevant to its project activities, and to carry out results monitoring and evaluation activities

Organization	Main Tasks and Responsibilities	Institutional Responsibilities within the Project
	drought, desertification, other agricultural disasters Working on the marketing of agricultural products Working on the support to be given to the agricultural sector and rural areas	Receiving and processing the complaints in accordance with Grievance Mechanism
General Directorate for State Hydraulic Works (DSI)	Conduct investigations and develop water resources River basin development Overall development and management of water resources Hydropower development Sediment-cleaning works Drying and draining of waterways because of the damage caused by floods and sediments Controlling erosion, sediments and floods Data collection for mapping, hydrometric measurements, water quality, agricultural economy, land classification, drainage, and hydrogeology.	Implementation of Sub-Component 1.2.A including planning, procurement, contract management, supervision, and financial management Preparing and ensuring implementation of the ESIAs, ESMPs, SEPs, RPs and LM Plans on site as relevant to its project activities, and to carry out monitoring and evaluation activities Receiving and processing complaints in accordance with Grievance Mechanism
General Directorate of Combating Desertification and Erosion	Formulating policies, strategies, plans and projects Building coordination and cooperation between concerned institutions and organizations regarding soil conservation, natural resources improvement, combating desertification and erosion, and avalanche, landslide and flood control activities Finding solutions not only for Turkey's problems but also for regional and international problems	N/A
General Directorate of Nature Conservation and National Parks (DKMP)	Conservation of biodiversity Ensuring that ecological services from watersheds contribute to the welfare of both the local population as well as downstream users	N/A
General Directorate of Highways (KGM)	Ensuring the safety of life and property on the roads Inspecting traffic on roads open to traffic in terms of compliance with traffic safety and marking rules Collecting and disposing of all kinds of waste materials (rubble, household and similar wastes) that cause environmental pollution and endanger traffic safety Collecting data on the causes of traffic accidents and taking necessary preventive technical measures	Implementation of Sub-Component 1.2.B. Preparing and ensuring implementation of the ESIAs, ESMPs, SEPs, RPs and LM Plans on site as relevant to its project activities, and to carry out results monitoring and evaluation activities Receiving and processing complaints in accordance with Grievance Mechanism
Disaster and Emergency Management Presidency (AFAD)	Preventing disasters and minimize disaster-related damages, plan and coordinate post-disaster response, and promote cooperation among various government agencies	N/A

Organization	Main Tasks and Responsibilities	Institutional Responsibilities within the Project
	Managing disasters through Integrated Disaster Management System, a disaster management model enabling risk management Developing necessary strategies and serving people in need at home and abroad	
Ordu Metropolitan Municipality Water and Sewerage Administrations (OSKI)	Implementation of pollution control policies, including water supply and construction and operation of wastewater treatment facilities	Providing permits and licenses required during the construction activities by Ordu Metropolitan Municipality To be one of the stakeholders to be considered foror the SEPs, RPs and LM Plans, if and when required. Operation of treatment plants and storage structures

DSI, KGM and TRGM will be represented at central level by PIUs, while OGM presence will lie with the PCU. Hence as the leading IA, OGM will be coordinating the PIUs in planning of sub-project specific ESF documents (ESIAs, ESMPs, SEPs, RPs, etc.). Implementation of these documents will be ensured through RD/PDs of IAs with the support of Regional Support Teams (RSTs) for each basin. In order to ensure a fluent conduct of works in compliance with WB ESSs, the PCU will be staffed with an E&S Team with full knowledge of WB ESSs and their application. PCU will be setting the frameworks, guiding and supervising the RD/PDs for local level implementation of E&S safeguards. E&S Teams will comprise of in-house technical personnel and consultants to be hired from outside.

Capacity development activities will be performed in the PIUs and RD/PDs, particularly for the in-house ESF personnel. Consultants of the ESF Teams will also take role as trainers.

In order to ensure coordination among SEPs for all sub-projects, RD/PDs will play a coordinating role. PCU and RSTs will support the RD/PDs by designing and planning integrated SEPs in compliance with the SEF set by the PCU.

4 ENVIRONMENTAL AND SOCIAL BASELINE SUMMARY

4.1 Baseline of Bolaman Basin

4.1.1 Environmental Baseline Summary

Geographical Location of the Basin

BRB is one of the sub-basins of the Eastern Black Sea Basin. It has a catchment area of 1339.5 km². It is at about 73 km to Samsun at the West and 55 km to Ordu at the East, and about 102 km to Reşadiye at the South.

Figure 4-1. Geographic Location of the BRB

Climate

Climate characteristics of the BRB is a major factor explaining the historical and active natural disasters and ongoing risks in the region, such as landslides and floods.

Climate characteristics of the basin is described making use of the characteristics of Ordu Province as representative for the whole basin in general, where the climate is mainly affected by the Black Sea: a mild climate, cold in winter. The Black Sea precipitation regime prevails, which yields the highest rainfall in autumn, and is rainy throughout the year. Significant differences can be seen in interior parts and the coastal zones. It is rainy throughout the year.

The climate data is taken from the 11 meteorological stations (please see Figure 4-2) within the boundaries of the basin, from which average temperature and total average precipitation values have been retrieved. Availability of climate data dates back to 2014 when meteorological stations were established. For the basin specific conditions, calculations using Thissen Polygon Method indicate an average precipitation of 81.31 mm and average temperature of 11.5ºC.

The average temperature in the coastal areas of Fatsa is higher than what is measured at the other meteorological stations. The lowest average temperature was recorded in Başçiftlik.

The hottest month is August and the coldest month is January. The highest temperature was recorded as 37.3°C in June 1995; the lowest temperature was -7.6 °C in January 1995.

The average of frost days is 9 as identified over the long-term data measured between 1959 and 2017. The average relative humidity value of Ordu Province is 74.7%. The highest humidity is in May and the lowest in December. The weather is clear 58 days a year, with cloudy 177 days and overcast for 130 days. Snowfalls are not common. Average days with snow cover, including high altitudes. The number of snowy days is 8, and the number of days with snow cover is 9. The highest snow depth in the long years was 72 cm in January.

The average monthly wind speed is 1.9 m/sec. The fastest winds come from the west with a speed of 35.7 m/sec. The average number days with strong wind or storm is 44 days. The dominant wind direction is South - Southeast (SSE).

The annual drought index varies between “abnormally moist” in interior parts to “exceptionally moist” in coastal areas of Ordu. However, the drought index is “moderately dry” in summer months, which explains the drought period in summer months that water scarcity is an issue for the seasonally increased population.

Rate of total average precipitation and average temperature increases from the south to the north of the BRB. The highest average temperature has been recorded as approximately 15 °C in the coastal regions of Fatsa. The highest total precipitation average has been recorded as high as 1600 mm on Kırlı Station.

See Figure 4.2 for the average temperature and average total precipitation distribution between 2014 and 2020 in the basin.

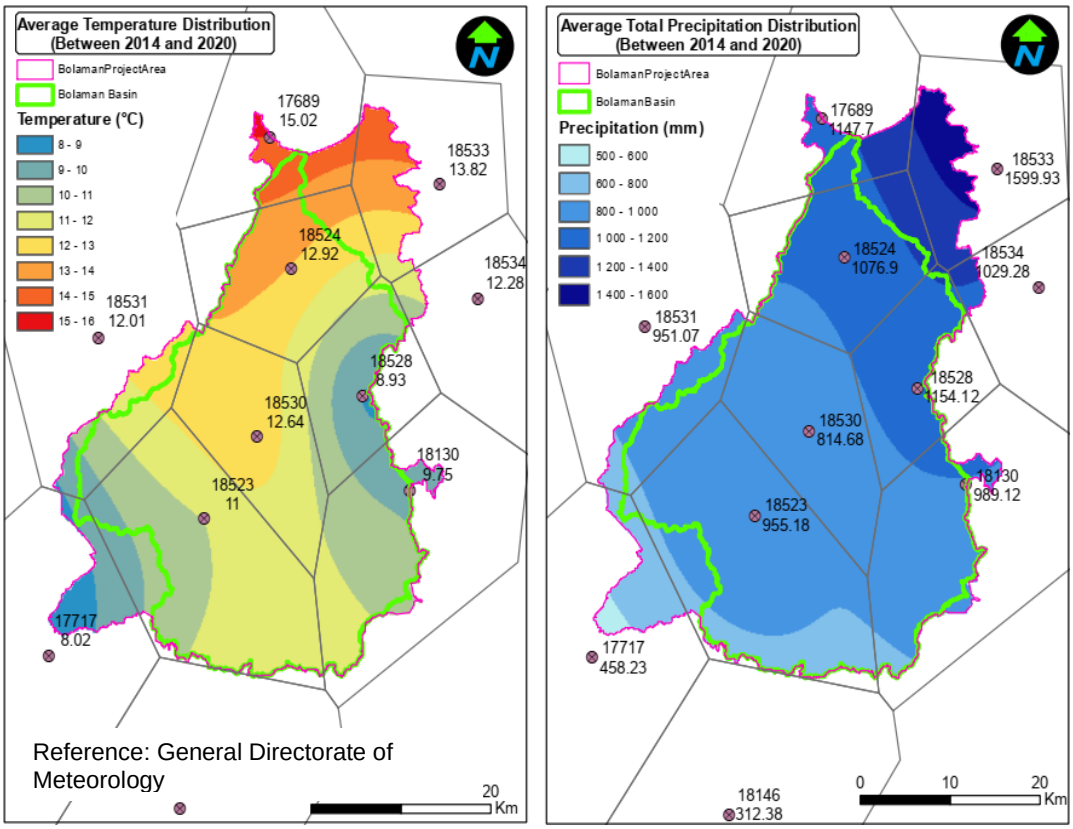

Figure 4-2. Average Temperature and average total precipitation (2014 and 2020)

Geology and Geomorphology

Limestone, sandstone and mudstone rock structures are common in the geology of the lower parts of basin. Central parts of basin are comprised of andesite and basalt rock structures whereas the upper parts are comprised of basalt, agglomerate, tuff and andesite rock structures. A large part of the BRB was formed during the Eocene and Upper Cretaceous periods. Lithologically; pyroclastic, anglomerate, surface volcanoes, and sediments make up 98.6% of the basin.

Geology map of the BRB can be seen in Figure 4-3.

It is possible to divide the BRB into three main geomorphological units: mountainous areas, plateau areas and plains. More than 50% of the BRB consists of plateaus; mountainous areas make up of 28.8% and flat terrain makes up 17% of the total basin.

Geomorphology of the basin explains the severe landslide incidences and erosion. The basin has a rough terrain with steep slopes, mainly influenced by surface flows. Literature cites deforestation for extending hazelnut plantations in the past, leading to increase of erosion prone areas. As any agricultural activity, hazelnut production had started on natural areas. Those areas suitable for hazelnut are natural forest areas of the Black Sea Coast. Therefore, either directly or indirectly (i.e. first converted to some other product, then to hazelnut) natural forests were converted to hazelnut orchards. This conversion period was highest in the 1975-1985, while it decreased after 1990s, although still exist in much smaller amounts as documented for Giresun province (Kurdoğlu et al., 2017). It would not be far-fetching to assume a similar process had taken place in BRB. Additionally, as studies using climate change projections predict and current reports from official bodies indicate, that the once most

productive areas for hazelnut growth – coastal areas up to 250 m. altitude – no longer produce as much hazelnuts during the last 4-5 years. On the other hand, hazelnut varieties adapted to higher altitudes seem to take over, which may lead to expansion of hazelnut orchards towards forest areas at higher altitudes (Ustaoglu and Karaca, 2014). Natural forests comprise a variety of forest trees, shrubs and herbal vegetation with various types of root structures, which stabilize the soil and prevent erosion. When this complex natural structure is replaced with a monotypic agricultural scheme through conversion, soil stabilization decreases and erosion increases. This leads to a substantial increase in the amount of areas prone to erosion due to conversion of natural forests into hazelnut orchards, especially in areas with increasing slope.

It is possible to express the factors that cause erosion in the basin in two groups as natural factors (i.e. slope, exposure, streams and climate) and human factors (i.e. land-use, take of vegetative land for settlement, agriculture, roads, industrial facilities, etc.).

The erosion risk map can be seen in below, as retrieved from the maps developed by General Directorate of Combating Desertification and Erosion (ÇEM). The erosion risk map shows that there are areas exposed to moderate level of erosion and severe level erosion in Fatsa, Çatalpınar, Çamaş, Gölköy, Niksar and Gürgentepe districts.

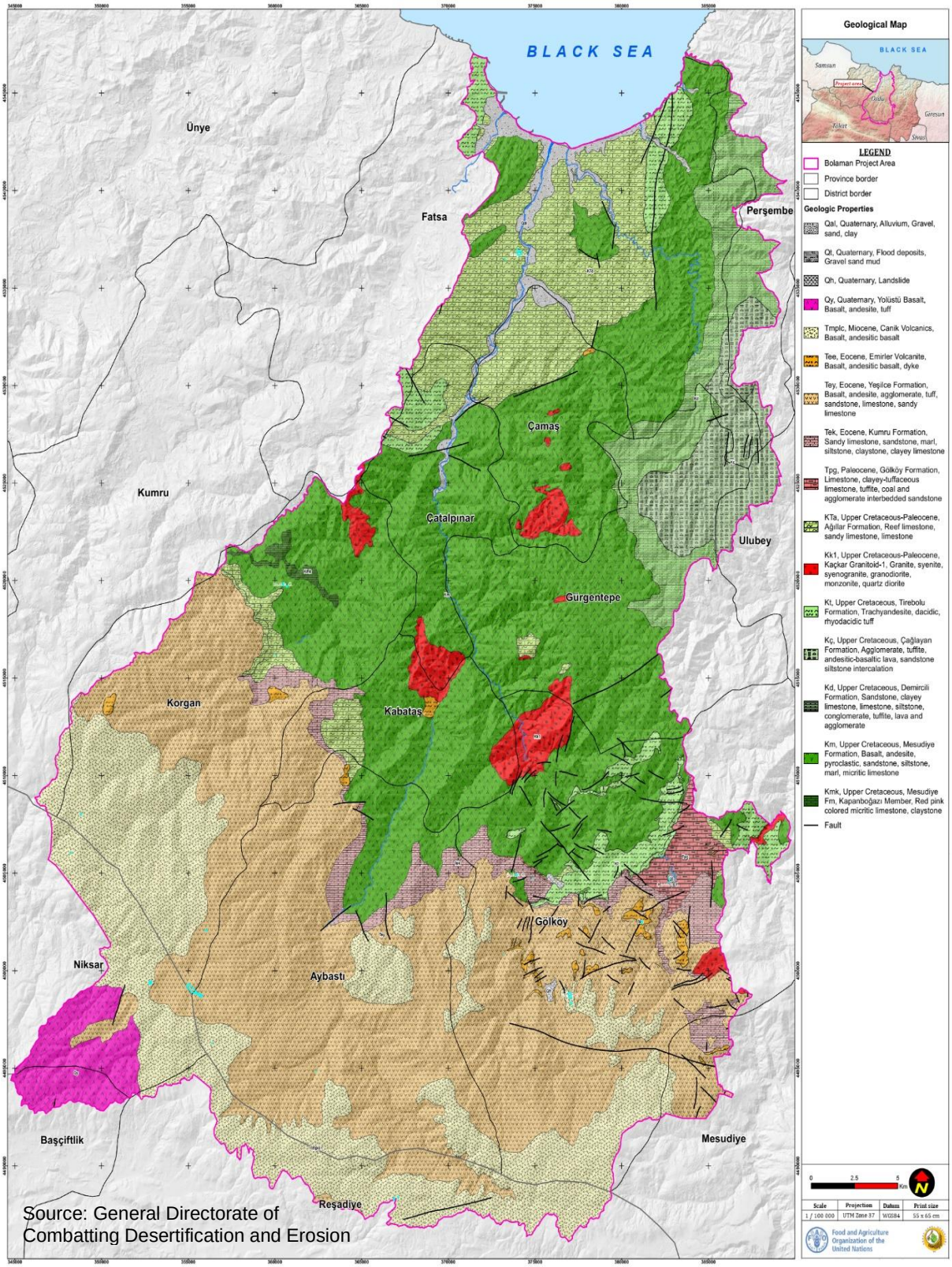

Figure 4-3. Geology Map for the BRB

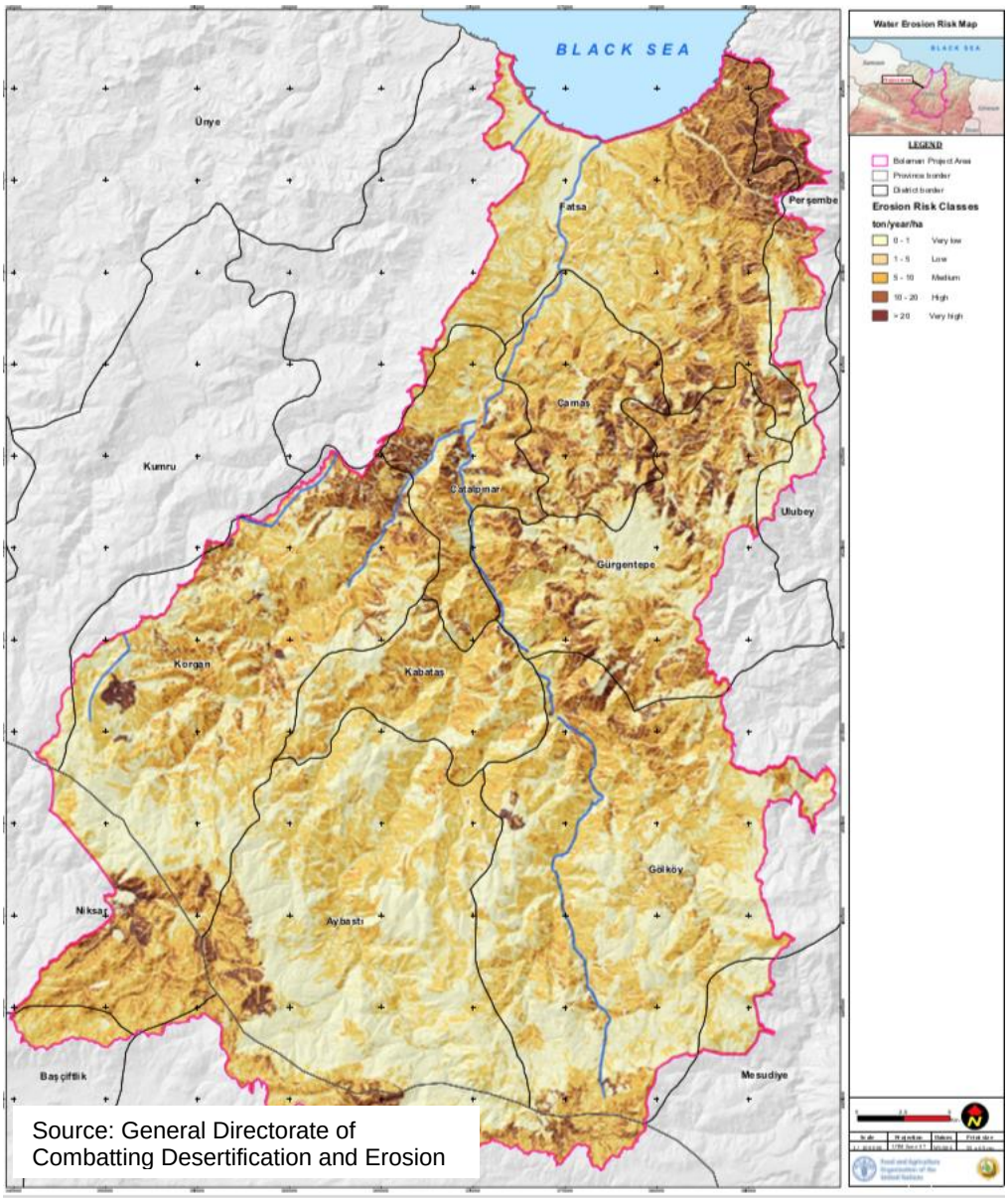

Figure 4-4. Water Erosion Risk Map of the BRB (ÇEM)

The erosion risk map shows that there are areas exposed to moderate level of erosion and severe level erosion in Fatsa, Çatalpınar, Çamaş, Gölköy and Gürgentepe districts.

About half of the basin has a slope of more than 20%. However, due to low socio-economic status, the forests have been destroyed and turned into hazelnut fields. Planting smaller plants instead of tall plants in the forests has facilitated the surface flow of water falling on the ground. Such misuse of land is one of the most important factors increasing the erosion in the basin.

Slopes facing the north Black Sea is dominant in a large part of the basin. The humid air masses coming from the north causes more rainfall on these slopes due to the exposure effect. The small materials formed on the slopes facing north under the influence of humidity and rainfall are transported to rivers or stream beds by rainwater or landslides. In the periods when the surface flow increases, the amount of material transported also increases. For this reason, the slopes facing north in the region are places at higher erosion risk.

The erosion risk is high on the native soils in the basin. The majority of the basin consists of native soils and there are eroded soils in the coastal part of Fatsa. Due to the fact that the native soils at higher slope values than eroded soils, the erosion rate is higher.

Landslides

One of the major issues triggered by geomorphological characteristics of the basin is landslides. Rapid urbanization and population growth also contribute to increased landslides. Landslides in the basin have caused significant damages to settlements and transportation routes over the years.

Sağlık Neighborhood in Aybastı district was prone to the impacts of the landscape disaster in February 2015. Residents lost their homes as a result of the disaster. The landslide affected an area of 22 hectares.

The Landslide map can be seen in Figure 4-5.

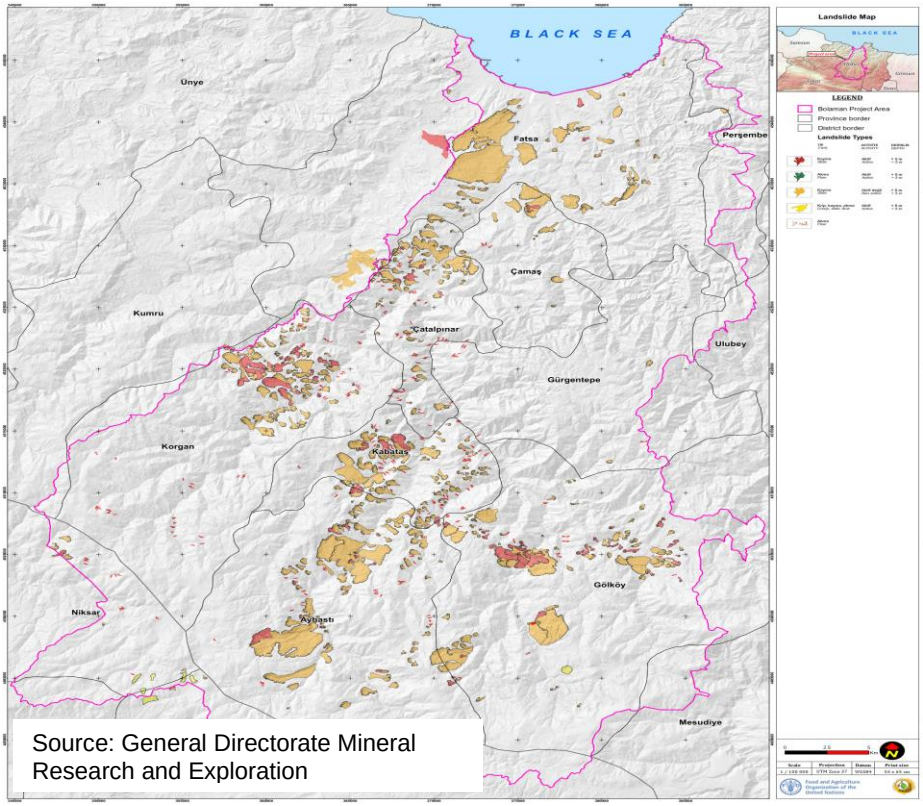

Figure 4-5. Landslide Map of the BRB

The regions at higher altitude are assessed to be more sensitive to landslides than regions at lower altitudes. This result may be assessed as higher parts especially in mountainous regions having more rainfall and more material transportation. The altitude increases to the south from the shore.

Although it would be expected that landslides would increase towards higher altitudes to the South, it is seen that landslides are affected by the humidity factor rather than altitude. Highest humidity is recorded in alluvial plains, mainly in the coastal section of Fatsa segments of the basin. Surface flow are retained on flat alluvial lands and infiltrates into soil layers, triggering further landslides.

Floods

Floods in the basin mostly occur following heavy storms. Maximum rainfall occurs from June to August, making it the most critical time period for flood disasters. In this time period of heavy rainfalls, soil is highly saturated with water highly. Given the existence of impermeable and semi-permeable rock layers and steep slopes and erosion values, rainfall easily converts into surface flows. This is further sparked by land-use practices including uncontrolled collection of aggregates from river beds.

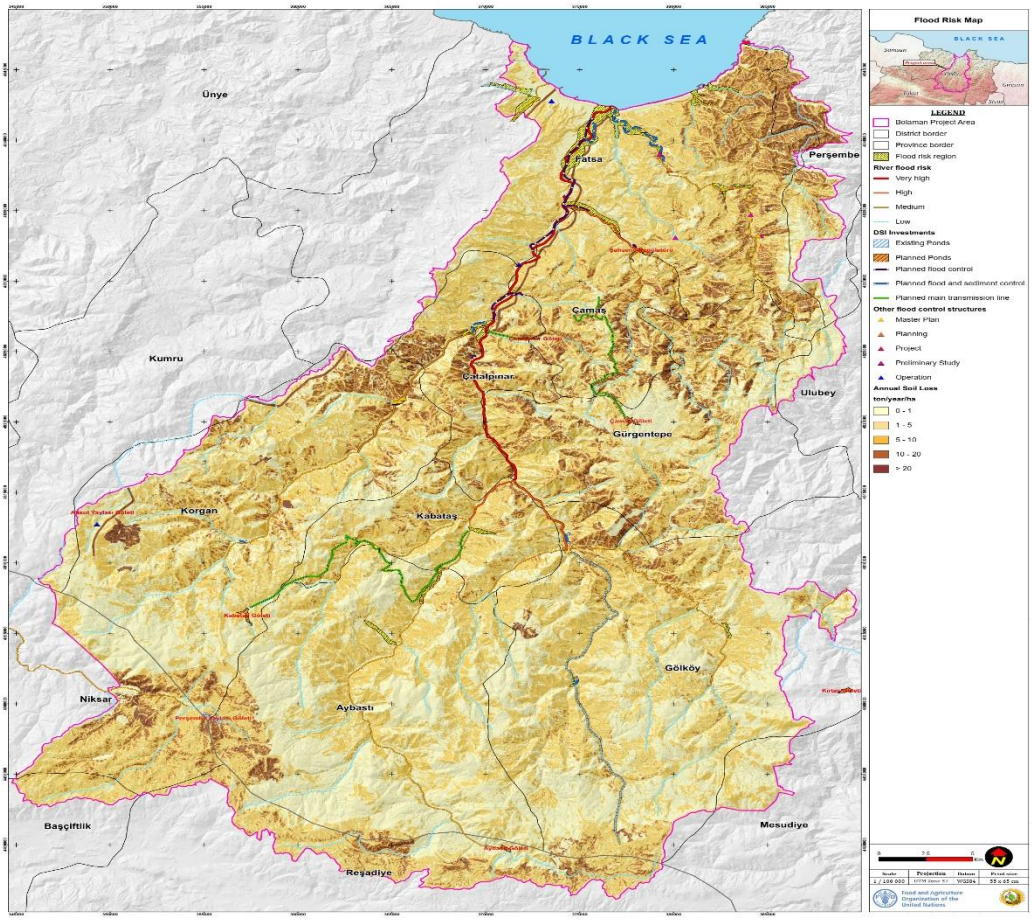

Figure 4-6. Flood Risk Map of the BRB

According to the flood risk map given in Figure 4-6, the fact that areas with a very high flood risk are located within the boundaries of residential areas such as Fatsa and Çatalpınar shows that these areas are likely to be damaged by a possible flood. At the same time, it is observed that flood risk is high in areas close to the sea where precipitation is higher, and slopes are low.

Vegetation Cover

The basin has a rough terrain, with altitudes varying between 0 to 1983 meters. Vegetation cover changes with respect to climate features, geomorphology and soil types. The typical vegetation cover is humid forest foundation dominated by broad-leaved trees that shed their leaves in winter. The vegetated areas up to 300 - 400 meters are comprised of shrubs and herbs formations, occupied by hazelnut fields in general. Trees are dominant at higher altitudes.

As altitudes increase, soil thickness and humidity decrease due to the increasing slope where vegetation has less demand for moisture, causing shrub and weed formations. The elements of the flora formation are cranberry, shrub, broom bush, wild nut, yellow flower rhododendron. It is also possible to see tall plants and different pine species.

As literature cites, agricultural lands in the region have rapidly increased since the 1930s. Thus, land cover of the basin has gradually transformed into mono-cultured area dominated by hazelnut producers. Initial expansion of the hazelnut gardens was established only in coastal areas, then spread rapidly towards the inner parts of the Basin. Consultations during the field visit indicate that changes in land-use have slowed down, still to be verified with the use of GIS layers of land-use and vegetation cover.

Table 4-1 provides information from 2018 and suggests that 45% is agriculture area of the BRB.

Table 4-1. Land Cover in the BRB

Land Cover	Area (ha)	Area (%)
Inland waters	442.84	0.28
Industrial area	252.52	0.16
Urban fabric	1440.83	0.91
Permanent crops	30,798.01	19.39
Heterogeneous agricultural areas	72,321.73	45.52
Arable land	452.40	0.28
Open spaces or no vegetation	231.80	0.15
Pastures	160.83	0.10
Scrub/herbaceous vegetations	23,333.75	14.69
Forests	29,431.23	18.53
TOTAL	158,865.94	100.00%

Source: Corine, 2018

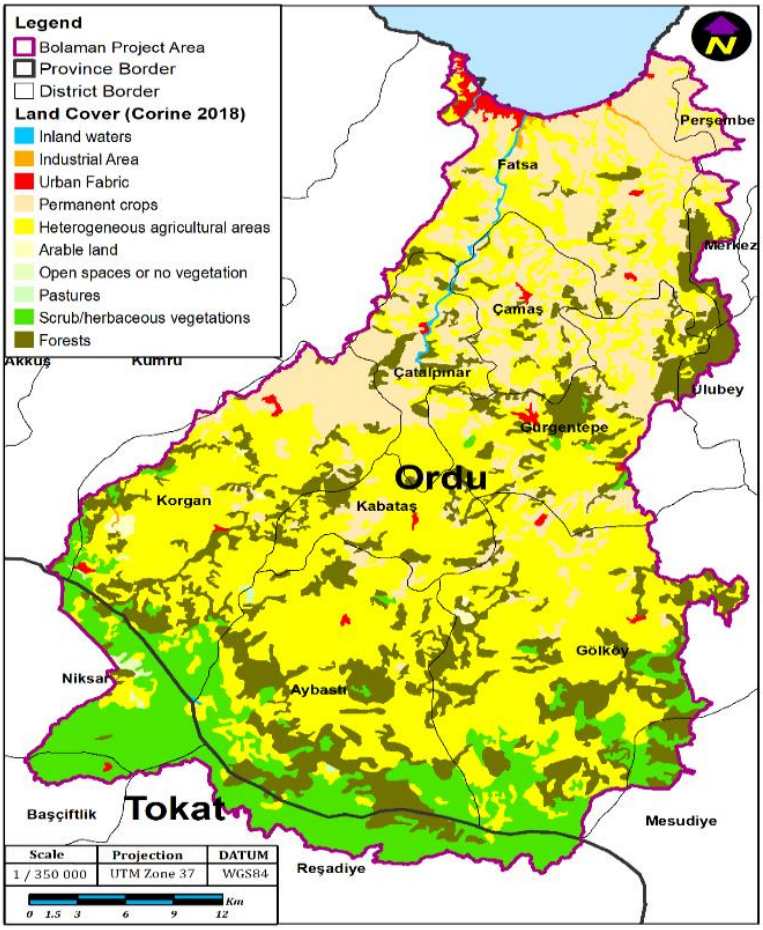

Figure 4-7. Land-use and Land Cover in the BRB (OGM, 2020)

Basin Hydrology

The basin is situated in the Eastern Black Sea (EBS) basin and covers an area of 1339.5 km^2. The NS length of the basin along Dipköy - Cimili line is 55.7 km; and the width along Gölköy - Dereköy line in EW is 37.4 km. BRB is comprised of 7 sub-basins as shown in Table 4-2.

Table 4-2. Sub-Basins in BRB and Percentages of Coverage

Sub-Basin Boundaries	Area (km2)	Percentage in the basin (%)
Bolaman Tributary	178.1	13.3
Şahsene Tributary	132.6	9.9
Ilıca Tributary	99.4	7.4
Keş Tributary	202.2	15.1
Eceli Tributary	329.5	24.6
Direkli Tributary	227.4	17.0
Medrese Tributary	170.3	12.7
TOTAL	1339.5	100

Source: Özdemir, 2006

Creeks and tributaries in the basin have relatively high flow rates and are active in all seasons. Flow rates increase after heavy storms and overflow the river beds, which causes increased

sediment loads. Natural lakes and ponds are mostly formed as a result of the blockage of drainage depression following landslides.

Bolaman River has three main branches: Karakoyun, Reşadiye and Gölköy creeks, which are fed by many small and temporary creeks. Bolaman river forms a corridor between the coast and the inner parts, between Tokat and Reşadiye. Heavy rainfall, especially in the form of downpours, causes the level of the stream to rise and flooding occurs in parts of the shallow parts of valleys.

Natural lakes and ponds in the basin are mostly formed after the drainage collapse is blocked as a result of landslides. Gaga, Ulugöl and Sülük lakes are the major lakes that formed in this way.

Gaga Lake was formed as a result of a landslide between Bolaman River and Yassıtaş tributary. There is a small islet in the middle of the lake. Lake surface is around 6 hectares. The lake is legally protected as a 1st and 3rd degree natural conservation site.

Ulugöl Nature Park was established in 07/09/2009. It comprises three landslide set lakes covering a total lake surface of 8 hectares and a total Nature Park area of 26.5 hectares, which include the surrounding forests. It consists of one large and two small lakes. There is one endemic and endangered fish species Salmo abanticus, which was artificially introduced in the large lake and two invasive fish species Pseudorasbora parva and Carassius gibelio found in the large lake.

Highest flows are recorded in general for March and April and the lowest flows in July, August and September. Low flow rates are recorded in summer due to high evaporation and lack of snow cover after June.

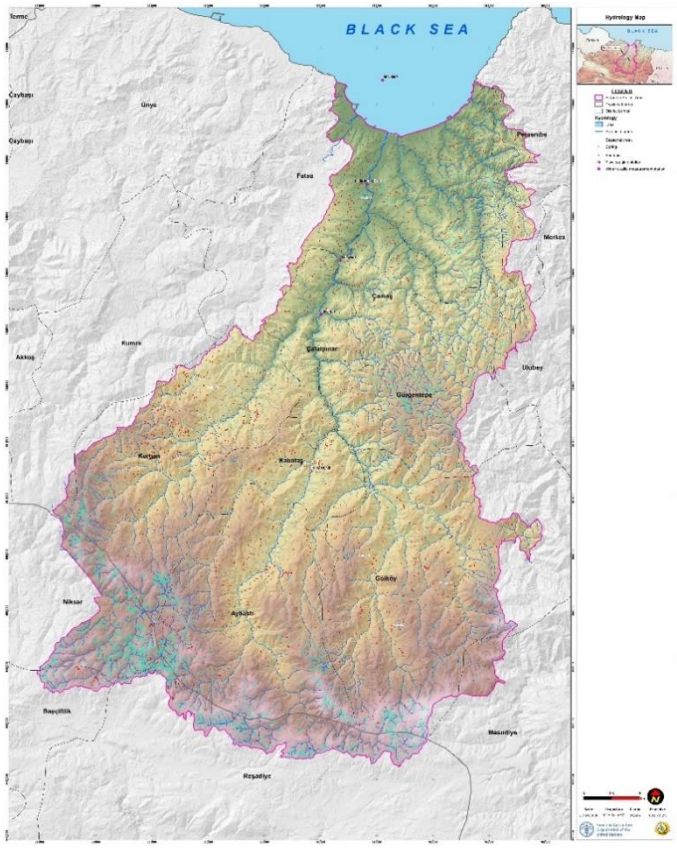

Figure 4-8. Hydrology Map of the BRB

Earthquakes

There are several faults with different characteristics within the basin, which are not likely to produce major earthquakes. Based on historical data, the most recent earthquake near the basin dates back to 1943, which occurred at a degree of 4.3.

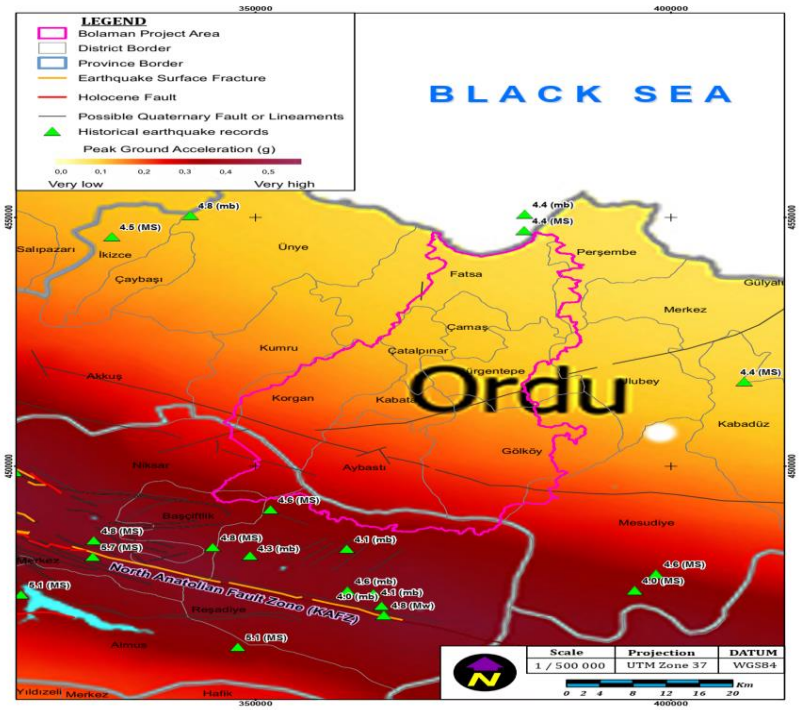

Figure 4-9. Earthquake Map of BRB

Although there are no active faults with the potential to cause earthquakes, the North Anatolian Fault line, one of the most important earthquakes, zones of our country, is located in the south of BRB and this fault line causes small earthquakes in the south of BRB. Severe earthquake throughout the basin has not been observed from past to present.

Soil Characteristics and Soil Quality

Soil types that spread in BRB are gray-brown podzolic soils, yellow-red podzolic soils, non-calcareous brown forest soils, brown forest soils and alluvial soils.

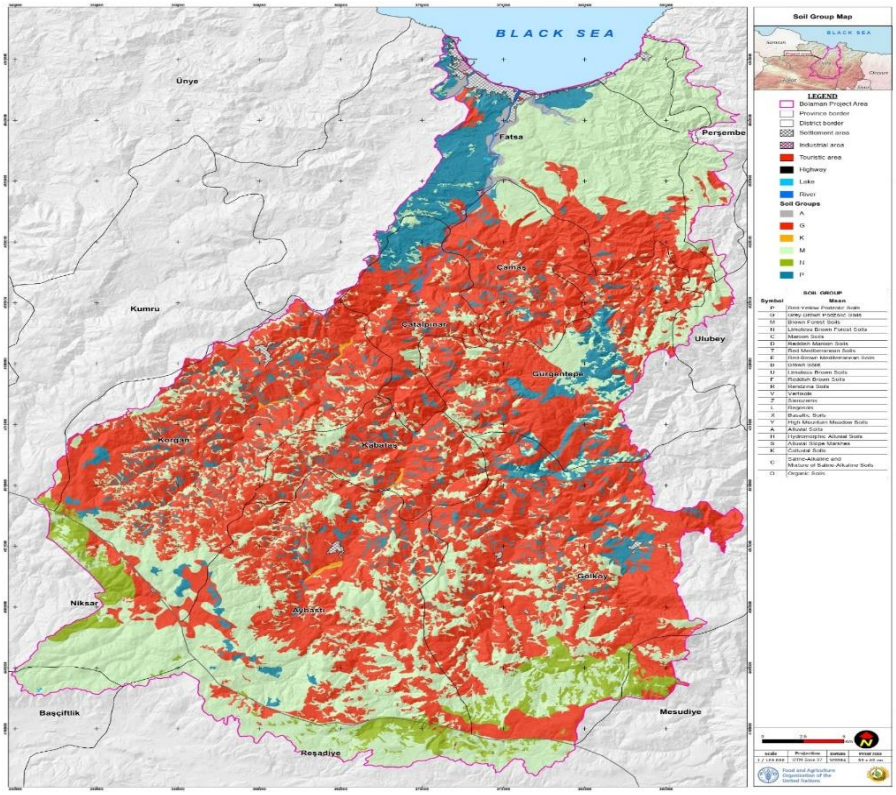

Figure 4-10. Soil Group Map of Basin

Table 4-3. Ranking of Activities Causing Soil Contamination in Ordu

Soil pollution causes	Industrial waste discharge	Mining wastes	Uncontrolled dumping of domestic solid wastes	Uncontrolled dumping of hazardous wastes	Unplanned urbanization	Excessive use of fertilizers	Excessive use of pesticides	Animal waste
Pollution degree	3	8	1	2	4	7	6	5

Source: MoEU, 2016

From the 2016 figures of MoEU for ranking of environmental problems in provinces, the main cause of soil pollution in Ordu is uncontrolled dumping of domestic and hazardous wastes.

Before 2019, all solid wastes were disposed in wild dumps, causing serious soil contamination. As of 2019, solid wastes generated in the basin districts are disposed in the sanitary landfill facility located in Çaybaşı district outside the basin. With the start-up of operation of the Çaybaşı landfill, wild dumps in the basin have been closed.

The other soil pollution is manure deposition from livestock grazing. Livestock breeding and grazing is a common sector of economy in the Bolaman basin. Some of the manure is used directly as natural fertilizers in agriculture. The remaining part is stored outdoors under unsanitary conditions and are dumped in the nearest lands.

Chemical fertilizers used in conventional farming methods are mainly nitrogenous, phosphorus, or potassium salts. Overuse of chemical fertilizers cause accumulation in the soil, causing salinization and contamination, eventually decreasing fertility of the soils.

The pesticides used in combating harmful insects and microorganisms also have important environmental pollutants for the basin.

Mines are rated with the least impact on soil pollution.

Air Quality

Air quality data for the basin is retrieved from province level records of air quality measurements at Fatsa station located in Ordu. Measured parameters are PM_{10}, NO_2, SO_2, NO and NOx. Table 4-4 gives yearly averages for the year 2017.

Table 4-4. Air quality measurement records for 2017

Months	PM_{10} (ug/m^3)	$S0_2$ (ug/m^3)	NO_2 (ug/m^3)	NO_X (ug/m^3)
January	74	64	104	158
February	70	52	136	150
March	75	39	107	161
April	61	33	91	124
May	44	7	70	91
June	33	7	16	22
July	31	6	16	21
August	-	7	15	20
September	11	10	16	24
October	25	10	26	41
November	17	25	28	49
December	37	46	32	55
Annual Average	45	27	55	80
Annual Limit Value[10]	48	20	48	30

Source: MoEU, 2019

Level of air pollution increases in winter season due to urban heating in general. SO_2, NO_2 and NO_x concentrations in the basin are above the limit values. At the same time, it is seen that PM_{10} values rise top level during the winter months.

The reasons for the concentrations exceeding the air quality limit values are fossil-fuel combustion and vehicle emissions for SO2; industry, vehicle emissions, fossil fuel combustion and agricultural activities for PM10; and vehicle emissions and high temperature combustion processes for NOx.

[10] Limit values according to Regulation on Air Quality Assessment and Management (Official Journal Dated 05.05.2009; No: 2719).

The community surveys indicate that air pollution is not seen as a serious problem in the basin. Muhtars[11] have noted that dust is source of nuisance on communities, mainly caused by motor vehicles on unpaved roads.

Water Quality

Water quality is a problem mentioned by local stakeholders and community members. It was stated on the site that the main water for drinking and domestic use is supplied from groundwater wells. Surface water resources are stated to be polluted by organic loads from grazing lands and hazelnut plantations by means of surface flow. Specifically, Aybastı Municipality obtains water from Kızılot Reservoir which also serves OGM as a firefighting reservoir at the same time. Aybastı Mayor expressed that the quality of tap water is not in compliance with Turkish Standards and a reliable and good quality water source is highly needed. This has been verified by high E. Coli and coliform rates in laboratory measurements performed in 2019. Furthermore, capacity of Kızılot Reservoir remains insufficient to meet the current demands in both qualitative and quantitative terms. It was also observed during the site visit that the reservoir has no protection fence to prevent access of animals to the source, which might be interpreted as the possible source of pollution in Kızlılot reservoir water.

Based on water quality records from the 3 water quality stations of DSI in the basin, it is seen that the surface water quality is 2nd class in the measurements made at the Bağlama - Korgan station, while the the surface water quality is 3rd and 4th class in the measurements made in Cevizdere - Kızılderesi and Bolaman - Hisarbey.

Table 4-5. Water Quality Records in the Basin

Station name	Bağlama-Korgan		Cevizdere -Kızılderesi		Bolaman -Hisarbey	
Surface water quality	Avg.		95%	90%	95%	90%
	2nd quality		4th quality	3rd quality	4th quality	3rd quality
T (oC)	Avg.		95%	90%	95%	90%
	14.7		31,1	26,4	30,9	26
pH	Avg.		95%	90%	95%	90%
	8.1		9,1	8,9	9	8,8
EC (µS/cm)	Avg.		95%	90%	95%	90%
	90		548	435	702	537
DO (%)	95%	90%	95%	90%	Avg.	
	100	100	105,8		96,6	
DO (mg/L)	Avg.		95%	90%	95%	90%
	8.9		12,9	12,2	13,2	12,4
COD (mg/L)	Avg.		95%	90%	95%	90%
	7,7		18,7	13,5	27,9	18,4
BOD5 (mg/L)	Avg.		95%	90%	95%	90%
	3		11,4	8,4	7	5,5
NH4	95%	90%	95%	90%	Avg.	

[11] Head of village/neighborhood.

(mg/L)	-	-	2,21	1	0,15	
NO3 (mg/L)	Avg.		95%	90%	95%	90%
	5,5		27,5	16,3	25	17
NO2 (mg/L)	Avg.		Avg.		95%	90%
	0,01		0,01		0,44	0,21
TP (mg/L)	Avg.		Avg.		Avg.	
	0,08		0,13		0,14	

Source: Eastern Black Sea Master Plan, 2016

Water quality records in the 3 stations are as follows:

Bolaman River - Hisarbey station:

The pollution is caused by the discharge of domestic wastewater and dumping of solid wastes from settlements near Bolaman River into its tributaries. At the same time, creeks are polluted due to the pesticides and fertilizers used in hazelnut orchards.

Cevizdere - Kızılderesi station:

Pollutants are mostly metallic mine-based waste, domestic and industrial wastes.

Bağlama-Korgan station:

Water quality is Class II according to criteria defined in the Regulation on Surface Water Management (Official Journal dated 30.11.2012; No: 28483). Class II refers to surface waters with potential for drinking water, recreation, fish production other than trout and irrigation. Wastes originating from domestic and agricultural activities in the region are discharged to Bağlama river.

Biodiversity

There are legally protected nature conservation areas and elements with high biodiversity value, within Project Area, including Gaga Lake Natural Site, Ulugöl Lake Nature Park and 12 Nature Monuments (monumental trees) found in Perşembe, Fatsa and Çatalpınar districts within the Bolaman River Basin Project Area (Ordu Department of Nature Conservation and National Parks, 2020) (Table 4-6).

Table 4-6. Legally Protected Areas Within Bolaman Project Area

No	Type of Area	Name of the Area / Asset	Type / Location
1	Natural Site	Gaga Lake	1st and 3rd Category Natural Site
2	Nature Park	Ulugöl Lake	Gölköy
3	Nature Monument	One monumental oak tree	Gündoğdu Village (Perşembe)
4	Nature Monument	Three monumental oak, and three monumental beech trees	Çamarası Village (Perşembe)
5	Nature Monument	Three monumental plane trees	Coastal Center (Fatsa)
6	Nature Monument	One monumental plane tree	Center (Fatsa)
7	Nature Monument	One monumental linden tree	Ortaköy Village cemetery (Çatalpınar)

The most up to date and complete study on the biodiversity of the majority of the Bolaman River Basin project area are the two official reports[12, 13] (GDNCNP, 2014 and 2018) on Terrestrial and Inland Water Ecosystems Biodiversity Inventory and Monitoring Work by the General Directorate for Nature Conservation and National Parks (GDNCNP) for Ordu (conducted in 2016-2018) and Tokat (conducted in 2013-2014) provinces. These studies have been accomplished by private companies with a definite methodology dictated by the GDNCNP and has specific outputs on biodiversity elements of Ordu and Tokat provinces at province level. The major outputs of these studies comprise: i) species diversity (plants, mammals, birds, inland fish, reptiles, amphibians, invertebrates), ii) indicator species from each species group and their monitoring plans, and iii) a synthesis of the distribution of biodiversity in the province, which defines "Special Biodiversity Areas" of habitats with high target species diversity, priority plant community areas and priority wildlife areas. The results of these studies should be used in determining the presence of critical habitats within or near each sub-project by following the guideline provided as a flowchart in the Annex 4 and avoidance, mitigation and monitoring should be undertaken through preparation of Biodiversity Management Plans, if critical habitats and/or nationally recognized conservation areas are present.

For instance, according to the Ordu Province Terrestrial and Inland Water Ecosystems Biodiversity Inventory and Monitoring Work Final Report, there are a total of 34 Special Biodiversity Areas determined for the presence of priority biodiversity features: i) three habitat areas with high target species diversity, ii) seven priority plant community areas and iii) 24 priority wildlife areas. According to the small-scale maps provided in the Appendix 5 of the report, six of the 34 Special Biodiversity Areas overlap with the BRB project area. These are namely Perşembe Plateau-1, Perşembe Plateau-2, Ulugöl Nature Park-1, Ulugöl Nature Park-2, From Fatsa to Aybastı-800m, and Black Sea Coastal areas (Table 4-7).

Table 4-7. Special Biodiversity Areas and Target Species

No	Type of Area	Name of the Area	Designated Target Species	IUCN Threat Category*	Endemicity
1	Special Plant Area	From Fatsa to Aybastı-800m	Trifolium kilaeum	EN	Endemic
2	Special Plant Area	Perşembe Plateau -1	Alchemilla orduensis	EN	Endemic
3	Special Wildlife Area	Black Sea Coast	None	-	-
4	Special Wildlife Area	Perşembe Plateau - 2	None	-	-
5	Special Wildlife Area	Ulugöl Nature Park - 1	Pseudorasbora parva**	LC	Not endemic
			Carassius gibelio**	LC	Not endemic
6	Special Wildlife Area	Ulugöl Nature Park - 2	Salmo abanticus	VU	Endemic

*IUCN threat cetegories EN: endangered; VU: vulnerable; LC: least concern
** Invasive species to be monitored

[12] GDNCNP, 2014. *Ministry of Forestry and Water Affairs, General Directorate of Nature Conservation and National Parks, 11. Regional Directorate National Biodiversity Inventory and Monitoring Project: Tokat Provincial Terrestrial Biodiversity and Inland Water Ecosystems Biodiversity Inventory and Monitoring Project Final Report*. 342 pg. Ankara. Eko-Zon Ltd. Co. (In Turkish).

[13] GDNCNP, 2018. *Ministry of Agriculture and Forestry, General Directorate of Nature Conservation and National Parks, 11. Regional Directorate National Biodiversity Inventory and Monitoring Project: Ordu Provincial Terrestrial Biodiversity and Inland Water Ecosystems Biodiversity Inventory and Monitoring Project Final Report*. 590 pg. Ankara. Nartus Ltd. Co. (In Turkish).

According to the report on Inland Water Ecosystems Biodiversity Inventory and Monitoring, two plant species with conservation priority are designated for conservation priority and monitoring are *Trifolium kilaeum* and *Alchemilla orduensis*. *Trifolium kilaeum* is a rare and endangered (EN for IUCN threat category) annual plant known from two locations, while *Alchemilla orduensis* is an endemic and endangered (EN) perennial herb which is under potential threat from overgrazing. The habitats where the populations of these two species are found, trigger Critical habitat, according to ESS-6 (23-a), since these plant species are endangered (EN) according to IUCN Red List.

As for the faunal biodiversity, one freshwater fish species *Salmo abanticus* (VU) is determined as conservation priority species, while another fish, *Pseudorasbora parva* (LC) is found as an invasive species (Table 4-6). *Pseudorasbora parva* is found only in Ulu Lake Nature Park and therefore designated to be monitored in order to prevent its population increase and spread to adjacent habitats. *Salmo abanticus* on the other hand is under threat of illegal fishing and water pollution mainly due to domestic, agricultural and livestock. Its habitat is also therefore deemed as a critical habitat with conservation priority. *Salmo abanticus* was only found in Ulugöl Nature Park too. However, it is highly possible that species would potentially be present in the connecting rivers, although it is reported that the species was deliberately released into the Ulugöl (Bostancı et al., 2015).

These Special Biodiversity Areas determined in the report also present aspects of critical habitats as briefly described in the report.

- Black Sea coast present habitats such as muddy estuaries, sandy seashores, mud flats and rocky shores for shore birds, both resident and migrant, providing feeding and breeding grounds.
- Perşembe Plateau has a mosaic of habitats including mostly subalpine grassland with many meandering rivers and high-altitude forest patches, supporting a high faunal biodiversity.
- Ulugöl Nature Park has terrestrial and freshwater habitats in combination with each other including lakes, reeds and forest.

The southern part of BRB coincides with Tokat province, and a similar study called Tokat Province Terrestrial and Inland Water Ecosystems Biodiversity Inventory and Monitoring Work by the General Directorate for Nature Conservation and National Parks (GDNCNP) was made. The report of this study presents a total of 23 Special Biodiversity Areas, where priority biodiversity features such as rare, threatened or endangered species or critical habitats are present. However, none of them are found in the within BRB.

Environmental Infrastructure and Services

Annual Reports of the Provincial Directorate of Environment and Urbanizations (PDEU) indicate the available infrastructure for environmental services: sewerage systems, water and wastewater treatment, solid waste disposal. The infrastructure elements have been mapped in the SESA stage in order to see geographic coverages, deficiencies, possible impacts and cumulative impacts together with the project investments. OSKI is another major stakeholder in establishing the baseline on environmental infrastructure

Drinking water in the basin is generally supplied from rivers and groundwater wells where surface water is not sufficient. According to the data obtained from DSI, 79 registered groundwater wells were identified in BRB. Groundwater is widely used in the district of Camaş. In the surveys conducted in the region, the muhtars were asked whether there was a change in water resources. As a result of the survey, approximately 90 percent of the muhtars stated that the water resources of BRB have decreased.

Wastewater treatment exists in the Kabataş, Fatsa and Çatalpınar districts. Settlements in other districts discharge their sewage into streams without treatment. For the districts not mentioned in the Table 4-7 below, the survey results were assessed, and it was determined that the discharge of wastewater into the stream was the general problem of the BRB. As a result of the survey, insufficient sewerage and discharge with no treatment are seen as the third major problem.

Table 4-8. Sewerage Infrastructure in Basin Districts

District	Sewerage system type	Population served	Treatment plant status	Discharge status
Aybastı	combined line	70%	No treatment plant.	Discharged into the stream from 2 different points, collector line required for discharge from a single point.
Kabataş	combined line	70%	The existing treatment plant has become unusable due to flood disaster.	Discharged into the stream from 4 different points, collector line required for discharge from a single point.
Gölköy	combined line	70%	No treatment plant.	Discharged into Gölköy Creek. Collector line is needed.
Çamaş	combined line	50%	No treatment plant.	Discharged into stream. Collector line is needed.
Fatsa	combined line	85%	Pre-treatment and sea discharge in place	Discharged into sea; need for collector line.
Korgan	combined line	30%	X	Discharged into the stream; need for collector line.
Gürgentepe	no wastewater line	X	X	Discharged into the stream; need for collector line.
Çatalpınar	combined line	80%	X	Discharged into the stream. Collector line is needed.

Source: OSKI, 2020

Cesspits are widely used in villages without sewerage system in the basin. According to the data obtained from DSI, 83 cesspits were identified in all district in the basin.

Current status of environmental infrastructure in the basin can be seen in Figure 4-11.

As of May 2020, solid wastes in the basin are collected by the municipalities in waste bins, transported by trucks and sent to the Çaybaşı Sanitary Landfill Facility. The EIA Report for the landfill was approved as “positive” by MoEU on 26.04.2017. Wastes were formerly disposed in an uncontrolled manner at dump sites (See Figure 4-11 for the geographic location of the dumps).

All uncontrolled waste disposal sites throughout the basin have been rehabilitated by capping with soil cover and installing gas control.

Sewerage systems are mainly available in urban zones. In rural areas, domestic wastewater is collected in cesspits or directly discharged into tributaries of Bolaman River. According to

the Environmental Status Report for Ordu dated 2019, wastewater treatment plants are present in in Fatsa District, Çatalpınar District and Tepealan Districts. The plants serve wastewater treatment in urban zones only.

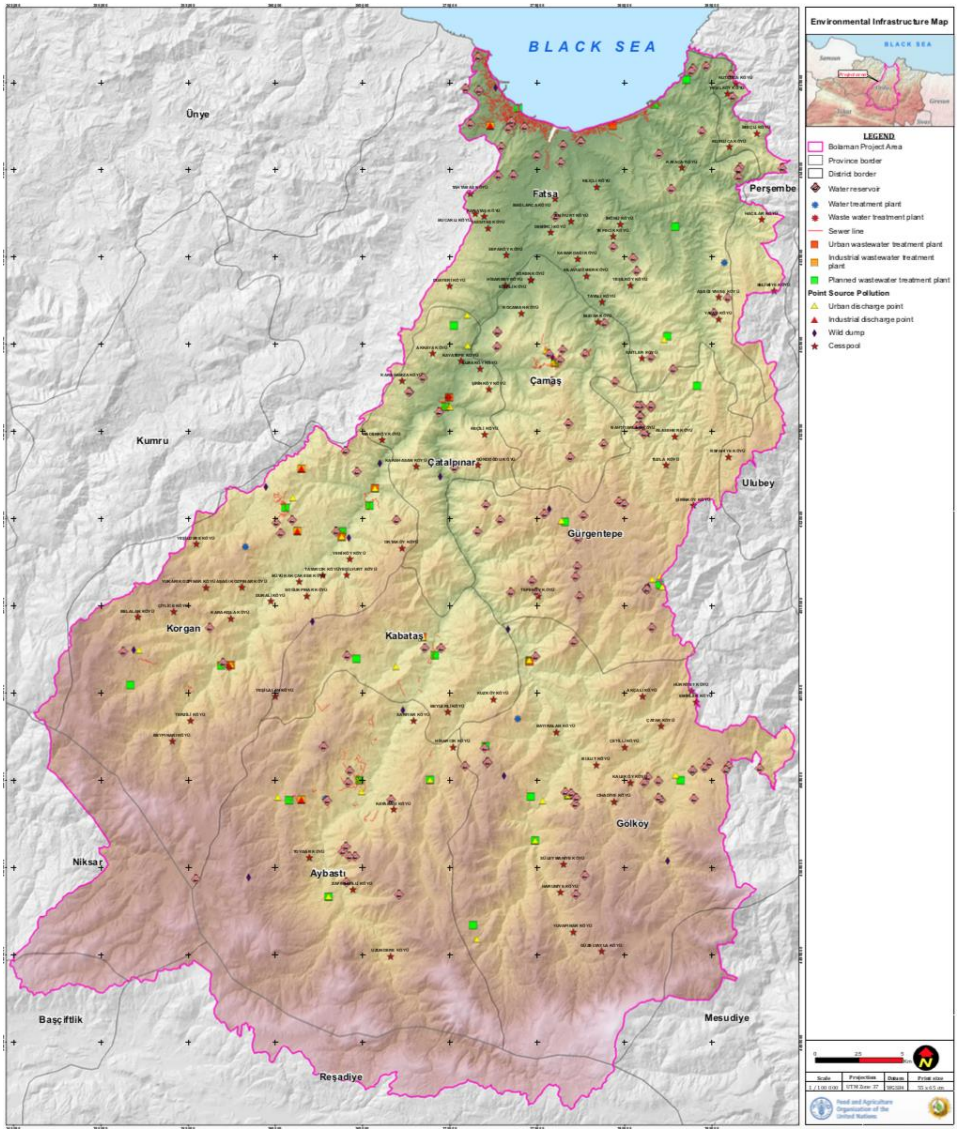

Figure 4-11. Current Status of Environmental Infrastructure in the Basin

Figure 4-11 shows the registered wells in the basin. Groundwater is used when surface waters are not sufficient. In the Bolaman basin, there is water supply from groundwater sources; drinking water, industry and agriculture etc. is used. There is no drinking water treatment facility that supplies water from groundwater sources.

Power Plants and Mines

Hydropower plants and regulators are located on Bolaman River, Reşadiye River, Keşkek Creek. Atila HPP on Bolaman River generates 10 MW power, Kuzey I and HPP on Reşadiye generate 5.55 MW energy. Irmak HPP on Reşadiye Creek produces 5.8 MW. There are no known issues/problems regarding environmental and social performance of the plants.

Four quarries are located in the basin. At the same time, small scale unlicensed mining is carried out in the region. As a result of the surveys conducted, the quarries are source of noise generation.

Quarries are for basalt, sand and gravel and limestone; with annual capacity range of 300-400 tons. EIA Reports are in place with approval of the MoEU. Compliance with environmental legislation is audited by the Provincial Directorate of Environment and urbanization on a regular basis. There are no known issues of incompliance.

Please see the location of hydropower plants and quarries in Figure 4-12 below.

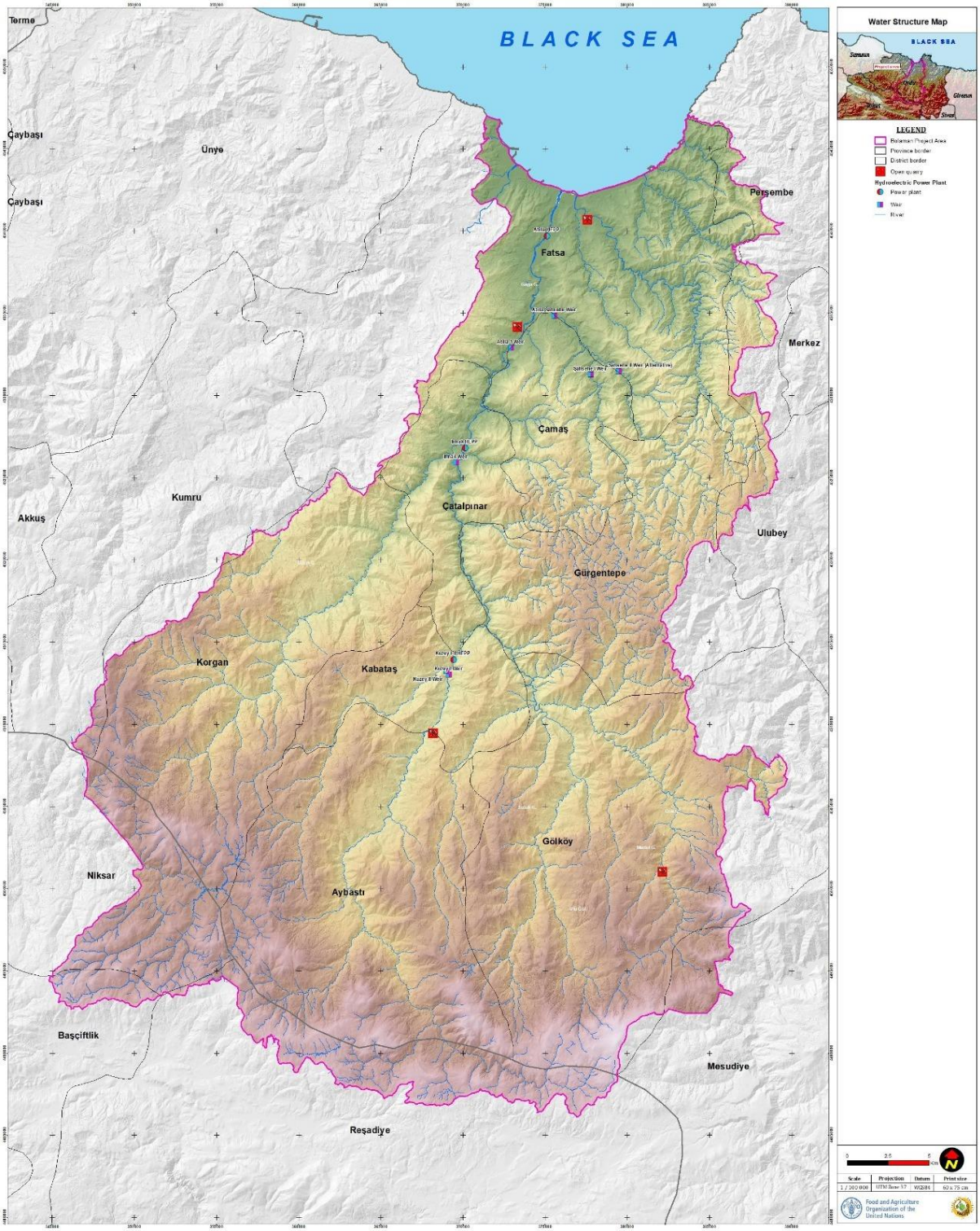

Figure 4-12. Location of Hydropower Stations, Regulators and Quarries

4.1.2 Social and Economic Baseline Summary

Population Dynamics

Ordu Municipality became a metropolitan municipality in 2013 and today, despite legally not having any locations that are classified as a village, the city is one of the most rural provinces in Turkey. However, the Basin has been witnessing an outgoing migration from its rural areas. In fact, between 1990 and 2007 the rural population in Ordu shrank by losing over 33% of its population. The small and fragmented land ownership in terrains with adverse conditions reduces agricultural productivity and is insufficient to support the livelihood of the residents. The main economic activity is hazelnut cultivation, which is carried out predominantly in August. Within this scarce source of livelihood support activities, the people in the basin resort to some wider alternatives. From mid-May to September animal husbandry becomes important in the high plateaus. Beekeeping is an important economic activity and beekeepers transport their beehives to other parts of Turkey for substantial periods of the season for the flowers to enrich the flavor of honey.

The population of the BRB, based on the estimation of the community survey results is 241,680. This estimate is very close to the official population statistics of the Basin for the year of 2019 which was 234,643. The estimated average permanent population size of the rural settlements is 912 and there are 265 settlements in the BRB. According to the findings of the Community Level Surveys (CLQ) the average number of households per settlement is 242. The smallest settlement has 20 households while the largest settlement has 1,500. Almost half of the settlements have up to 199 households living in them.

Settlements

The settlements in the basin are places which usually have been sending migrants to the other cities in Turkey and abroad. The settlement experiences temporary population increase during three months in summer, mainly due to expatriate visits and people returning for the hazelnut harvest during the summer months. This is a substantial, regularly recurring population movement every year. Fifty-five per cent of the settlements in the basin receive temporary populations well above their permanent population. In fact, more than 20% of them experience temporary population increase more than twice of their permanent population. On average each settlement receives around 923 new temporary residents in summer months. It can be estimated that temporary population increase in the BRB especially in the summer months is 236,180 people. Together with the permanent population, the population reaches approximately to half a million. This exacerbates infrastructure related problems in the basin, such as roads, power and water supplies, sewers and so on.

Migration

One of the main characteristics of the outgoing rural migration in Ordu is the migration of young people. This trend is also evident from the increasing elderly and decreasing young populations in rural parts of the region. The proportion of child population (Age 0-14) in rural Ordu is 14.9% and this is well below the national average which is 26.6%. Considering the distribution of the population of settlements by age, the high rate of the population aged 65 and over is striking. According to data from the 2019 the average rate for this age category for Turkey was 9.51%, while this rate is 24.5% for the settlements located within BRB. In other words, the rate of this age group is almost 3 times higher in the settlements compared to Turkey's population.

Apart from permanent migration there is also temporary labor migration from the basin. It has been estimated that there are about 62,000 temporary migrants from the settlements in the Basin. An overwhelming majority of the temporary workers from the Basin worked as

construction workers in the destinations of their temporary migration. It could be estimated that 58,000 of these migrants were men, 2,500 were women and about 1,500 of them were young people between the ages of 14 and 16. These young people usually accompany their fathers as apprentice mechanics in repair works.

Economy

Besides agriculture and farming, the BRB has limited variety of economic activities. Majority of the industrial activities in the province are directly related to the agricultural production, in particular to hazelnut which is not cultivated all year around. Hazelnut production is seasonal and most of the industry in Ordu is directly related to hazelnut production (such as processing, packaging and so on); workers are active just for a couple of months following the hazelnut harvest and there is no raw material supply for the industry to be sustainable all year around. Hence, workers in the hazelnut processing industry work seasonally which significantly restricts the industrial employment opportunities and its contribution to the local economy. The province produces goods and services for its own market therefore it has a closed economic structure, and this is an important source of economic problem. Because every new business established in the same sector in the city is disconnected from production and cuts from the profit of the other establishments in the market which makes the survival of these establishments in a shrinking market conditions very difficult. The market is restricted due to the closed economic structure of the city therefore each new business coming to market, instead of creating a new economic value takes away from the profit and market share of the existing establishments. According to İŞKUR data, the rate of unemployment among the university graduates in the Ordu is 25% compared to 14.2% which is the average unemployment rate in Turkey for the same group. Such data can also be considered as one of the explanatory factors for Ordu's outward migration. This data also highlights the fact that unemployment is a problem in the BRB for both highly qualified skilled people and for unskilled people. The commercial and industrial structure of the city and its low-yielding agriculture are another important reason that explain this out going migration process.

Socio-Economic Status

The Socio-Economic Status (SES) index that ranks the population according to various variables including, income, leisure time activities, ownership of various assets and so on. These statuses ranked from A+ (highest) to D (lowest). In all districts of the Basin over half of the population's SES statuses are in Group D which is the lowest group. In summary, the majority of the people in the Basin have the lowest SES status that is also well below the country average. The results of the Socio-Economic Development Index carried out in 2017 by the Turkish Ministry of Industry and Technology puts the city in the 60th place out of 81 cities. This ranking also puts Ordu in the fifth category which in near the lower end of the SES (the lowest being 6). In addition, people receiving some assistance from the Social Assistance and Solidarity Fund makes about 28.46% of the population of the entire BRB in 2019.

Average Income

The income per household differed enormously in the Basin however, on average household in the Basin earns 22,816TL per year. This is much lower than the one person's annual minimum wage in Turkey. Annual minimum wage in Turkey for the year 2020 varies between 27,888 TL and 29,748 TL depending on the marital status and the number of children of the wage earner. Moreover, according to Income and Living Conditions Survey of TurkStat (2019), the average household disposable income in Turkey was 59,873TL. What is more striking that when earnings of the forest communities in the Basin taken into account the annual income per household in these communities is even lower and on average their annual income was 18,480TL per household.

When the type of economic activity that was the source of livelihoods was asked, 132 households expressed 252 livelihood sources for themselves. Accordingly, 85 households (64.39%) mentioned agriculture as a source income, this was followed by retirement pension (45.45%), waged or salaried labor (36.36%), self-employment (21.96%), animal husbandry (17.42%), government social funds (3.78%) and beekeeping (1.52%). The households were also asked to specify primary and secondary sources of livelihood. For 40 households the retirement pension was primary and for 70 households the agricultural income was secondary source of livelihoods as there were pension and wage earners and self-employed in this group. As the data suggests, the majority of households had multiple sources of livelihood, such as farming as well as retirement pensions.

According to Ordu Agriculture Master Plan, although having only 1.2% of the country-wide agricultural lands in Turkey, Ordu ranks first with its registered farmers. However, these lands owned by farmers are rather small, having size between 0.1-20 decares which points out clearly the fragmentation of agricultural activity.

Major Environmental and Social Issues of the Settlements

Muhtars were asked about the five major problems of their communities. 73 muhtars provided 304 problems and most of them pointed in the same directions. Lack of water or inadequate water services emphasized by 63 muhtars which corresponds to 86% of the communities. This was followed by road related problems (n=63) such as lacking maintenance, not being adequate and sometimes the absence of roads was a problem. These were followed by electricity related problems (n=39), regular power cuts mentioned quite often and sewage problems (n=37) as there were no sewage system in most of the settlements. Another important problem was livelihood problems and unemployment (n=28); lack of health service provisions (n=14); inadequate rubbish collection (n=10); lack of social facilities (n=10) and inadequate infrastructure.

A substantial proportion of the villages does not have an elementary school (79%), 84,2% of the settlements do not have secondary school and 94,7% do not have high school either. The lack of kindergarten in the settlements of the BRB was also widespread. CLQ provided some detailed information about the education level of the residents of the BRB which are described in the follow section.

Education level

Many muhtars emphasized that the educational level in the neighborhoods among the current residents would have been better if the higher educated proportion of the population had not migrated. High level of percentage (53%) of elementary school graduation and below (i.e. without formal education) in the settlements is the function of economically active age people between the ages of 14 and 65 who had higher education qualifications having left the Basin for better economic and social opportunities. Elderly people are more likely to be lower educated because of the conditions of schooling at their younger years. It is also known from the literature as well as survey study that more educated people more likely to migrate. This could also explain the high proportion of lower education of the current residents. The low level of education of the population residing across the rural parts of the BRB could be problematic in terms of achieving the targets of the project where some aspects of these targets relay on the human capital of the Basin.

Age Groups

The fertility rate is low in the basin due to outgoing migration of the population at fertile ages. One of the outcomes of this is the lower population proportion for the ages between 0 and 14. Because of the lack of the youth and geographically dispersed nature of the settlements many

of the neighborhoods in the BRB witnessed school closures in their local communities. According to the date provided by Ordu Provincial Directorate of National Education, 88,74% of the neighborhoods in the BRB rely on bussed education[14]in order to have access to nursery, elementary, secondary and high school education.

Health

The results of the CLQs showed that, only 15 (19,7%) out of 76 settlements has a Community Health Center (CHC) and only 8 of these CHCs have permanent doctors for the working days. The rest of the settlements receive their health services once a week for a couple of days per month. Therefore, majority population of the settlements located within the BRBhas to travel some distances in order to access to the CHCs.

As many communities in the BRB in lack of basic education and health services, their access to qualified transportation service (including public transport and quality of access roads) to access educational and health services is critical for proper functioning of their everyday lives.

Cultural Diversity

Bolaman is a basin that also contains a cultural richness in its social life. Nowadays, there are quite a few Georgian villages or quarters in the BRB. The desktop review also showed that there are also 37 Alevi villages in Ordu and some of them are located within the borders of the Basin. There are quite a few Armenian and Greek minorities living individually in certain settlements in the BRB. However, there are no known open conflict issues amongst these cultural groups. They, all speak Turkish and have a very similar income and land ownership patterns.

Vulnerable Groups

The hazelnut harvest in the BRB heavily relies on the seasonal agricultural laborers. Their geographical origins were mainly Şanlıurfa, Diyarbakır, Mardin, Batman, and Georgia. Almost all seasonal agricultural workers arrive in August and stay for a month. Further data analysis suggests that on average each settlement receives 198 seasonal agricultural workers. According to our estimation there are 198 villages that receive seasonal migrant workers for the hazelnut harvest season. It is estimated that for the year 2020 on average 39,200 agricultural workers came to the Basin to work. The majority of the agricultural seasonal workers are women. These children come to the Basin with their seasonal agricultural worker parents or relatives.

A special research called “Child Labor Research” was carried out for Turkey related with child labor between the 5-17 age in the last quarter of 2019 (October-November-December) by TurkStat. According to survey data, the number of children between 5-17 age group working in an economic activity was determined as 720.000. It was seen that 70.6% of the child labor was composed of boys. It was determined that 34.3% of working children did not continue their education.

According to the survey data, it is understood that children working in the agricultural sector are in the second place with a rate of 30.8% and the first one is service sector with a rate of 45.5%.

[14] In settlements where there is no educational institution, the school-age children are registered to the schools of the closest settlements to continue their education. They are then bussed to these schools in other settlements from their howm settlements.

When data was analyzed by age, it was seen that the percentage of children (aged between 5-14) working in agriculture sector is 64.1%.

When the factors negatively affecting the physical health of children in the working environment, it was seen that children were working in unsuitable weather and thermal conditions and they were exposed to chemicals, dust, smoke or harmful gases. On the other hand, it was determined that 6.4% of the working children are under the risk of accidents; while 4.6% are at risk for eye fatigue or visual focus in the workplace where they work (TurkStat, Labor Force Survey, 2019).

According to a study[15] conducted in 2012, child workers come especially from the Southeast and East Anatolia Regions and they can be handled in two groups: First group is the children who work in the family business or in another business for free or for a fee. These children work during the day when they find a job, spend the evenings or unworked days at home. In the second group, there are children who go to work other regions with their families and relatives seasonally, for periods approximately between 3-7 months' work.

No data is available about the Syrian refugees working as seasonal agricultural laborers in the BRB.

4.2 Baseline for the Çekerek Basin

4.2.1 Environmental Baseline Summary

Geographical Location of the Basin

The Çekerek Stream watershed is bounded by 39◦ 30' and 40◦ 45' N latitudes, and 35◦ 15' and 36◦ 15' E longitudes. Çekerek Stream is formed by the joining together of small streams that originate from the Kızık, Dinar, Calı and Kavak hills, near Çamlıbel district. Çekerek Stream is approximately 276 km in length. The stream joins the Yesilırmak River near Kayabası. The water quality of the stream is low salinity-low sodium, which can be used for irrigation purposes for plants with moderate salt tolerance in most cases without special practices for salinity control (Yürekli, ve diğerleri, 2004). This basin area covers approximately 1,165,440 ha, which is about 1.5% of Turkey's total area. The Çekerek River Basin (CRB) together with Çorum River basin is given in Figure 4-12 shows Çekerek River Basin and Çorum River Basin, using GIS applications on Google Earth imagery.

[15] Gülçubuk, B. (2012), "Child Labour Exploitation In Agriculture and Social Sensitivity", Çalışma ve Toplum Journal, 2012/2 (33), p. 75-94.

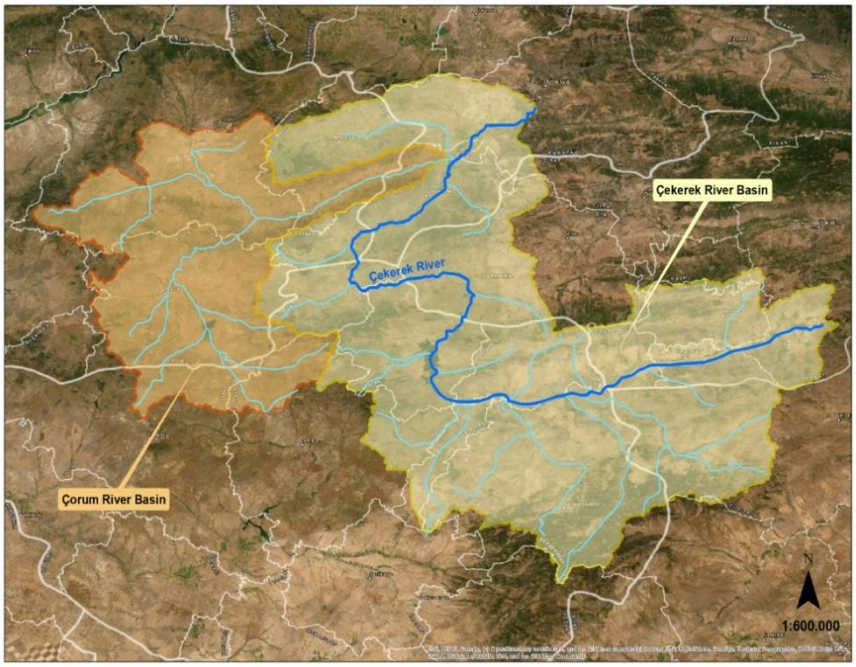

Figure 4-13: Geographic location of the Çekerek River Basin (CRB)

Source: Google Earth, Imagery Date: February 2019

Geology and Morphology of Çekerek River

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

Due to the fact that CRB is situated at the transition zone between the Black Sea and Central Anatolia, the geology and geomorphology of the basin shows variations. At the upper part of the basin, geologic features belonging to the Middle Black Sea Region come to the fore, and in the lower basin area geologic features belonging to the Central Anatolia Region are observed. The major geographical features of the basin are mountainous and rugged grounds, having steep slopes (AYLAR, 2015).

According to TÜBİTAK Marmara Research Center (TÜBİTAK MAM) Environment Institute, different characteristics are observed throughout the basin in terms of lithology. Paleozoic, marble, quartzite, mica schist and phyllites are seen in the upper basin, while limestone, conglomerate, magmatic rocks caused gabbro and serpentines are seen in the lower basin. Turhal Metamorphics forms the north of the Tokat massif is a Tectono-stratigraphic unit that controls the conditions of the project area. In the study conducted by Yılmaz (2004) on "Geology and Stuctural Evolution of the Tokat Massif (Eastern Pontides, Turkey)", a metamorphic complex of pre-Liassic age is divided into two basic units in the Tokat Region. The researcher states that these units are the Turhal Metamorphics and Devecidağ Complex, where Turhal Metamorphics characterize the metavolcanic-sedimentary sequence forming the

north of the massif, while the metamorphic units forming the Tokat massif are also observed in other parts of the eastern pontids and along the Northern Anatolian Ophiolite Belt.

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

According to Üstüntaş and İnceöz (1999), the oldest unit outcropping in the Region is the Tokat Massif, and formations belonging to the Upper Jurassic-Lower Cretaceous Amasya group consisting of limestones unconformably overlie this rock. In the same study, it is stated that the Amasya group is composed of Ferhatkaya and Carcurum formations that are laterally transitive to each other, and that rocks belonging to the Tokat Massif and the Amasya Group come over the Middle Eocene aged Çekerek Formation in the study area with a tectonic touch. The Çekerek formation consists of the Kozluca Member, which is generally made of sandstone-mudstone-marl alternation at the bottom, the Kuzualan limestone member consisting of limestone lithology, and at the top, the volcano-sediments named Göynücek agglomerate member made of agglomerate and tuffs. It is stated that the Mio-Pliocene Kemerkaş formation and alluviums uncomfortably cover all these units.

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

Although there are no active faults in the CRB Area, North Anatolian Fault Line, one of the most important earthquake zones of the country is located above the lower basin, around Çorum Province. Ridges are parallel to the fault throughout in this section, sedimentary drainage and fault valleys are typically seen (DEMİRTAŞ, 2019). In addition, Çekerek Basin is located in a 3rd degree earthquake zone. Based on historical data, the most recent earthquakes near the basin dates back to 1940, which occurred at a degree of 6.2 in Sorgun, Yozgat, and 2020, which occurred at a degree of 3.4 in Çorum City Center.

Erosion

In the Erosion Modeling Report of ÇRB based on the USLE Method (2018), the erosion sensitivity of ÇRB was determined by using the combination of various factors such as slope values, land cover, precipitation values, soil characteristics, and according to the Report, the erosion sensitivity of the basin was reached to 18 tons/ha/year. This value is considerably higher than average of Turkey. Erosion intensity is quite high due to the fact that the basin has an arid-semiarid climate and its slope values are high, which has a great effect on the erosion severity in the land cover. As a result of the climate characteristics of the region, the forest areas are effective in increasing erosion as they occupy less space. In addition, dry farming is intensely carried out in the region and this increases the amount of erosion. The current state of erosion in the ÇRB poses a serious threat, and it is necessary to raise awareness among the people of the region, especially those dealing with agriculture and animal husbandry, and to prepare Erosion Prevention Plan.

Floods

Flood events are very rarely seen at Çekerek Basin. Floods in the basin mostly occur following heavy storms. The major flood events recorded in the basin is provided below in Table 4-9.

Table 4-9. Characteristics of Floods That Occurred in Çekerek Basin

Date	Location	Stream and Tributary	Precipitation Area (km^2)	Peak Discharge (m3/s)	Property Damage (USD)	Loss of Lives
13.01.1966	Yozgat (Çekerek)	Gezbel Stream	28.20	79,00	-	-
		Domuz Stream	2.70	56,30	31,961	-
11.06.1973	Yozgat (Çekerek)	KIYI MEVKİİ Stream	0.16	1,91	3,026	-
01.09.1974	Yozgat (Çekerek)	ÖLÜSÜN Stream		139,64	21,285	-

Source: DSI, 2016

Climatic Factors

The CRB is situated in the interior parts of Central Black Sea Region. Therefore, it is under the influence of both Black Sea climatic characteristics and continental climate in Central Anatolia. With this characteristic, its climate has a feature of transition between Black Sea climate and Steppe climate in Central Anatolia. Summers are generally hot and dry in lowlands, warm and rainy in uplands from place to place. Cold and snowy winters are the general characteristic of the climate prevailing in the basin.

As it is given above semi-arid continental climate of the Central Anatolian Region is dominant at lower part of the basin. The harsh climate conditions of semi-arid continental climate is soften a little in the Çekerek River Valley, where the effects of the Black Sea climate is observed in the basin (Yozgat Governorship).

Precipitation

Meteorology stations belonging to Turkish State Meteorological Service and General Directorate of State Hydraulic Works in and at the close proximity of the basin were used to determine the precipitation characteristics of the basin. Tables 4-10 and 4-11 present long term monthly and seasonal average precipitation values of the meteorological stations (DSI, 2016).

Precipitation data show that high altitude sections of the basin, which are approximately forming South and South-East border of the basin, are having more precipitation compared to low altitude sections. These high altitude sections are also forming a barrier between Black Sea and inner Anatolia. Lowest value of the precipitation is observed at Alaca, which is located at Çorum-Alaca River sub-basin with a yearly average precipitation of 384.4 mm.

Average precipitation of the basin 447 mm indicates the basin have semi-arid behavior. In this respect, main part of the precipitation occurs during spring and winter seasons, where the summer has the lowest figures. During spring and winter months, 68.2% of the total precipitation occurs. The data also show that August is the driest month in terms of precipitation.

Table 4-10. Total Precipitation in Çekerek River Precipitation Area (mm)

Station	Elevation	Observation Period	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total
Alaca (Çorum)	925	1957-1959 1961-2008	35.9	29.3	35.9	45.9	56.9	41.3	11.4	11.6	17.9	25.9	31.7	40.6	384.4
Ortaköy (Çorum)	800	1961-1976 1990-2012	42.8	34.9	41.6	54.6	55.8	40.2	11.5	7.5	20.4	28.4	42.6	47.2	427.7
Aydıncık (Yozgat)	840	1965-1990	51.3	32.3	43.7	67.5	53.6	31.2	9.9	4.3	14.9	26.4	45.3	54.6	435
Yozgat	1298	1929-1935 1938-2012	66,6	60,9	66,6	60,8	64,5	42,4	12.3	8,6	17,6	34,2	54.7	77.9	567.1
Çekerek (Yozgat)	925	1950-1954 1956-1990	40.9	39.3	39.9	54.6	62.0	44.2	10.9	4.6	12.1	27.8	38.5	40.3	415.1
Akdağmadeni (Yozgat)	1300	195-1900	58.0	49.6	60.6	71.4	72.5	47.5	12.3	8.4	17.4	35.9	45.4	62.7	542.0
Çayıralan (Yozgat)	1340	1950-1990	69.0	53.3	62.1	64.8	64.9	44.5	5.4	3.9	10.3	28.6	47.0	67.0	520.8
Sulusaray (Tokat)	950	1965-1988 1991-2001	47.4	43.0	44.4	60.9	63.7	34.4	11.0	8.9	11.7	34.7	41.0	51.4	452.4
Artova (Tokat)	1200	1938-1990	53.0	40.5	48.9	56.2	64.1	39.5	8.9	4.6	15.9	33.2	43.0	54.9	462.8
Pazar (Tokat)	540	1970-1992	41.7	38.4	39.6	67.7	60.7	41.0	13.2	4.3	14.7	42.7	42.7	42.5	449.2
Yıldızeli (Sivas)	1415	1953-1965 1967-1991	42.1	33.9	44.1	52.5	63.3	35.7	5.9	2.7	13.0	23.6	38.3	45.9	401.0

Source: DSI, 2016

Table 4-11. Seasonal Distribution Precipitation in Çekerek River Precipitation Area

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

Source: DSI, 2016

Temperature

Long term monthly average, minimum and maximum temperature values are provided in Table 4-12. The data show that the values below zero at average temperatures are an indication of continental climate characteristics from North to South (DSI, 2016). The average temperature data indicates that January is the coldest month in the basin, which is common for all meteorological stations. Average minimum temperature in January varies between -3.2 °C (Artova) to 2.1 °C (Tokat) in the basin. On the other hand, the data also show that minimum temperatures are observed in February and the minimum temperature changes between -15.9 °C Akmağdeni) and -35.5 °C (Artova).

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

Table 4-12. Monthly Temperature (°C) Values in the Çekerek River Precipitation Area

Station	Observation Period		Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Octob.	Nov.	Dec.	Annual Total
Alaca (Çorum)	1967-2008	Maximum	17.0	19.5	25.5	29.8	32.6	36.2	41.7	38.1	36.1	31.2	24.0	18.0	41.7
		Average	-1.7	-0.8	4.2	9.5	13.6	17.4	20.2	20.2	16.1	10.9	4.8	0.4	9.6
		Minimum	-27.0	-31.2	-26.4	-10.6	-5.5	-2.0	3.0	2.4	-2.2	-8.0	-20.5	-26.1	-31.2
Aydıncık (Yozgat)	1969-1990	Maximum	17.5	22.9	28.5	31.6	34.5	36.5	41.5	37.1	32.9	28.5	25.5	25.8	41.5
		Average	-1.1	1.5	4.6	9.8	14.4	18.0	20.2	19.6	15.9	11.0	5.4	1.4	10.1
		Minimum	-19.4	-23.4	-20.4	-2.2	-2.2	5.2	6.6	6.6	2.4	-2.2	-6.6	-11.8	-23.4
Akdağmadeni (Yozgat)	1965-1990	Maximum	17.4	18.0	22.0	29.6	29.4	32.8	35.0	35.7	33.0	28.8	23.4	15.7	35.7
		Average	-2.9	-1.0	2.4	7.6	11.6	14.9	17.4	17.3	14.3	9.1	4.1	-0.5	7.9
		Minimum	-17.0	-15.9	-12.2	-4.3	0.1	3.4	5.6	5.0	0.9	-2.9	-7.8	-14.5	-17.0
Çorum	1929-2013	Maximum	17.5	20.4	28.6	30.4	35.1	37.5	42.6	40.2	38.7	33.6	25.6	19.2	42.6
		Average	-0.5	0.9	4.8	10.5	15.1	18.6	21.2	21.2	17.1	11.9	6.2	1.8	10.7
		Minimum	-25.6	-27.2	-23.3	-9.4	-4.3	0.2	3.4	3.0	-3.0	-6.3	-21.5	-24.4	-27.2

Artova (Tokat)	1970-1990	Maximum	15.0	16.0	22.5	28.3	30.2	31.3	36.0	36.5	32.0	31.5	27.7	15.5	36.5
		Average	-3.2	-1.4	2.8	8.5	12.5	15.7	18.0	18.0	14.4	9.4	3.9	-0.7	8.2
		Minimum	-35.2	-35.5	-32.0	-9.0	-4.2	-0.6	2.0	0.5	-3.8	-11.2	-21.0	-23.4	35.5
Tokat	1950-2013	Maximum	20.2	22.8	31.1	35.1	36.1	38.5	45.0	40.8	38.9	35.3	35.6	23.0	45.0
		Average	2.1	3.5	7.3	12.5	16.3	19.9	22.3	22.3	18.8	13.7	7.9	3.8	12.5
		Minimum	-23.4	-22.1	-21.2	-6.3	0.0	2.7	6.1	6.7	0.9	-3.2	-11.8	-21.0	-23.4

Source: DSI, 2016

Surface and Groundwater Resources

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

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.

Same as Çekerek River, only alluvium aquifer has been defined as the groundwater source in Çorum - Alaca sub-basin. Alluvium aquifer thickness in the lateral valleys varies between 8 - 10 m (DSİ, 1976). The sandy gravelly levels of alluvium generally start after 2 - 3 m of soil cover. Groundwater sources in the Çekerek Basin are provided in Table 4-13 below.

Table 4-13. Spring and Groundwaters in CRB

Province	District	Amount of Water Drawn from The Source (hm^3/yr)
Yozgat	Aydıncık	1.42
	Çekerek	2.27
	Kadışehri	0.99
	Akdağmadeni	1.84
	Sorgun	1.82
Çorum	Alaca	2.12
	Ortaköy	0.82
Tokat	Artova	0.87
	Sulusaray	0.16
	Yeşilyurt	1.49
Sivas	Yıldızeli	0.43

Source: DSI, 2016

Land Cover

The CRB consists of four provinces Tokat, Yozgat, Sivas and Çorum, namely. In Tokat, agricultural sector has become the dominant in the provincial economy. The main crops grown are wheat, barley, corn, legumes, tobacco, sugar beet and sunflower. In addition, a significant amount of fruit is produced in the central district, especially peaches. In the province where livestock breeding is also important besides vegetative production, a widespread beekeeping activity is carried out especially in the central district, Reşadiye and Zile (DSI, 2016).

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

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

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

Land Classification in the Çekerek Basin

Soils of the CRB are defined by 8 classes according to the land use capability classification data produced by Ministry of Agriculture and Forestry. In terms of this classification, first four soil classes are suitable for agriculture. Other three classes, Class 5, 6 and 7 can be used as meadows, pastures and forests, which are not suitable for cultivation compared to the other soil classification. Class 8 soils, which is mainly comprising, salty soils, outcrops or rocky grounds and/or steep slopes etc., are considered as not suitable for any crop production (DSI, 2016). Table 4-14 shows the area of capability classes in the CRB.

Table 4-14. Çekerek Basin Land Use Capability Classes (ha)

Land Use Capability Classes	Çekerek
I. Tillage Suitable for Agriculture	85,295
II. Tillage Suitable for Agriculture	134,354
III. Tillage Suitable for Agriculture	124,451
IV. Tillage Suitable for Agriculture	114,262
V. Tillage Unsuitable for Agriculture	550
VI. Tillage Unsuitable for Agriculture	128,994
VII. Tillage Unsuitable for Agriculture	208,302
VIII. Land Unsuitable for Agriculture	4,097
Others	395,402
Total	1,195,707

Source: DSI, 2016

Soil Resources and Land Use of the Basin

In order to determine the soil potential in the basin according to the Irrigated Agriculture Land Classification criteria used by the General Directorate of State Hydraulic Works, Soil and Drainage Branch Directorate, Land Use Capability Classes have been converted to State Hydraulic Works Irrigated Agricultural Land Classes. The width and distribution of the land classes obtained as a result of the evaluation of the soil, topography and drainage qualities of the lands according to DSI General Directorate of Irrigated Agricultural Land Classification criteria are given in Table 4-15.

Table 4-15. Distribution of Land Classes According to DSI Standards (ha)

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

Source: DSI, 2016

Biodiversity

There are a number of legally protected nature conservation areas and elements with high biodiversity value, within Çekerek Basin1[16, 17]. These include, Kadıpınarı and Oluközü Nature Parks in Akdağmadeni district of Yozgat and Ulukavak Nature Monument in Çekerek district of Yozgat (Table 4-16).

Table 4-16. Legally protected areas within Çekerek Basin project area

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

General Directorate of Nature Conservation and National Parks (GDNCNP) is the main responsible state agency to identify and protect the biodiversity of Turkey. GDNCNP has been conducting province level biodiversity surveys to determine the distribution of critical species and habitats[18]. Çekerek Basin extends throughout four provinces: Yozgat, Tokat, Sivas and Çorum. GDNCNP has completed the biodiversity surveys and produced a "Final Report of the Terrestrial and Inland Water Ecosystems Biodiversity Inventory and Monitoring Work" dated 2018 for each of these four provinces. These studies have specific formats with outputs on:

i) Species diversity data and maps (plants, mammals, birds, inland fish, reptiles, amphibians, invertebrates),
ii) Indicator species from each species group and their monitoring plans,
iii) Current threats and conservation suggestions on species and habitats,
iv) EUNIS habitat maps of the provinces,
v) A synthesis of the distribution of biodiversity in the province, which defines 'Special Biodiversity Areas', that include:
    a. Habitats with High Target Species Diversity,
    b. Priority Plant Community Areas,
    c. Priority Wildlife Areas.

The final reports and accompanying digital data and maps should be used to evaluate the presence of critical habitats for each sub-project, as part of sub-project specific environmental and social assessment, using the guidelines provided as a flowchart in Annex 4 and avoidance, mitigation and monitoring should be undertaken through preparation of Biodiversity Management Plans, if critical habitats and/or nationally recognized conservation areas are present.

A pilot study on determining the Natura 2000 sites in Central Anatolian Region of Turkey was conducted and completed in 2018 by GDNCNP. The results of this study, which are

[16] Ministry of Environment and Urbanization, Natural SITE Areas of Turkey, 2020. https://www.csb.gov.tr/sit-alanlari/arama
[17] Ministry of Agriculture and Forest, General Directorate of Nature *Conservation* and National Parks, Protected Areas of Turkey, 2020. https://www.tarimorman.gov.tr/DKMP
[18] Ulusal Biyolojik Çeşitlilik Veri Tabanı, 2020. Noah's Arc Biodiversity Database. http://www.nuhungemisi.gov.tr/Projects/Ubenis

summarized in a publication[19] by GDNCNP indicates that one Natura 2000 Special Protected Area is determined in Akdağmadeni district, overlapping with the Çekerek Basin. This is not yet a legally protected area but is one of the 34 conservation-priority sites determined for the Central Anatolia within Natura 2000 framework. It is stated in this introductory document that, each of these priority areas contain four critical habitats, and 14 priority species, on average, according to Union norms. Additionally, 42 EUNIS habitat types were defined within the project area. The relevant results of this study will be officially requested. Again, the final reports and accompanying digital data and maps of this study should be used to evaluate the presence of critical habitats for each sub-project, as part of sub-project specific environmental and social assessment, using the guideline provided as a flowchart in Annex 4.

Three of the 36 biodiversity hotspots of the world have extensive regions in Turkey[20]. These are Mediterranean Basin, Irano-Anatolian and Caucasus hotspots. Çekerek Basin project area has a minor overlap with the Irano-Anatolian biodiversity hotspot (see Figure 4-14).

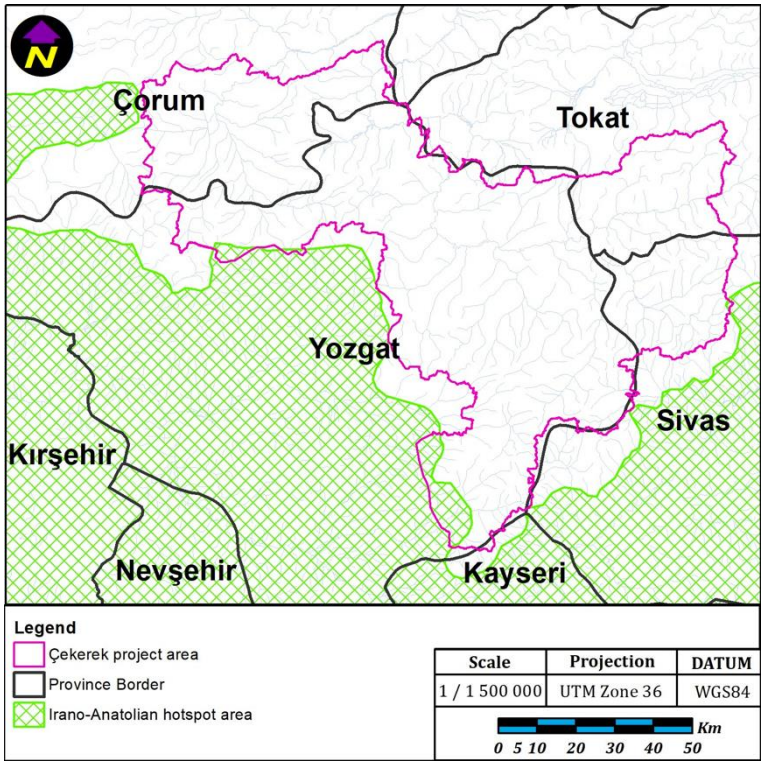

Figure 4-14. Çekerek Basin Project Area and Irano-Anatolian Biodiverstiy Hotspot

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

[20] Critical Ecosystem Partnership Fund, 2020. https://www.cepf.net/our-work/biodiversity-hotspots

Additionally, there are national assessments on the regional biodiversity hotspots of Turkey, which are Key Biodiversity Areas of Turkey[21], Important Plant Areas of Turkey[22], Important Bird Areas[23], Priority Butterfly Areas of Turkey[24] and Systematic Conservation Planning of Black Sea Region and Anatolian Diagonal[25]. The nearest national hotspots and legally protected areas in Çekerek Basin project area are shown in Figure 4-15 and their distances to the project area are given in Table 4-17.

Table 4-17. Distance to Legally Protected Areas and Biodiversity Hotspots

No	Protected Area	Distance of Çekerek Project Area to Legally Protected Areas
1	Davulbaztepe Nature Park	5 km
2	Üçtepeler Nature Park	12 km
3	Yozgat Fatih Nature Park	7.8 km
4	Yozgat Çamlığı National Park	7.8 km
5	Boğazköy-Alacahöyük National Park	0.5 km
6	Kaz Lake	9 km
7	Seyfe Lake	80 m
8	Tokat Kaz Lake Wildlife Protection Area and Nationally Recognized Wetland	7 km
9	Yenipazar Key Biodiversity Area and Important Bird Area	19 km
10	Priority Conservation Areas of Anatolian Diagonal Systematic Conservation Plan	0.5 – 12 km

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

[21] Eken, G., Bozdoğan, M., İsfendiyaroğlu, S., Kılıç D.T., Lise, Y. (ed.) 2006. *Key Biodiversity Areas of Turkey*. Nature Society, Ankara. (*in Turkish*).
[22] Özhatay, N., Byfield, A., Atay, S. 2003. Important Plant Areas of Turkey. Association for the Protection of Nature.
[23] Kılıç, D.T., Eken, G. 2004. *Important Bird Areas of Turkey – 2004 update*. Nature Society, Ankara, Turkey. (*in Turkish*).
[24] Karaçetin, E., H.J. Welch, A. Turak, Ö. Balkız and G. Welch. 2011. *Conservation Strategy for Butterflies in Turkey*. Nature Conservation Centre, Ankara, Turkey.
[25] Turak, A., Balkız, Ö., Ambarlı, D., Durmuş, M., Özkil, A., Yalçın, S., Özüt, D., Kınıkoğlu, Y., Meydan Kocaman, T., Cengiz, S., Albayrak, F., Kurt, B., Zeydanlı, U., Bilgin C. 2011. Systematic Conservation Planning of Black Sea Region. Nature Conservation Centre, Ankara. (*in Turkish*).

Table 4-18. .

Table 4-18. Critical species and habitats found in KBAs and IBA within Çekerek Basin

No	Type	Name	Species Group	Species / Habitats	IUCN Threat Category	Endemicity	Distribution
1	Key Biodiversity Areas	Akdağmadeni Forests	Plants	*Campanula pulvinaris*	EN	Endemic	Local endemic
			Habitats	Scots pine forests, mixed with oak and juniper	-	-	-
2		Ballıca Hills	Plants	*Salvia reeseana*	VU	Endemic	-
			Mammals	*Rhinolophus mehelyi*	VU	-	-
3		Kazankaya Valley	Plants	*Scorzonera ekimii*	CR	Endemic	-
			Birds	*Neophron percnopterus*	EN	-	-
			Mammals	*Lutra lutra*	NT		
4	Important Bird Areas	Kazankaya Valley	Birds	*Gyps fulvus*	LC	-	-

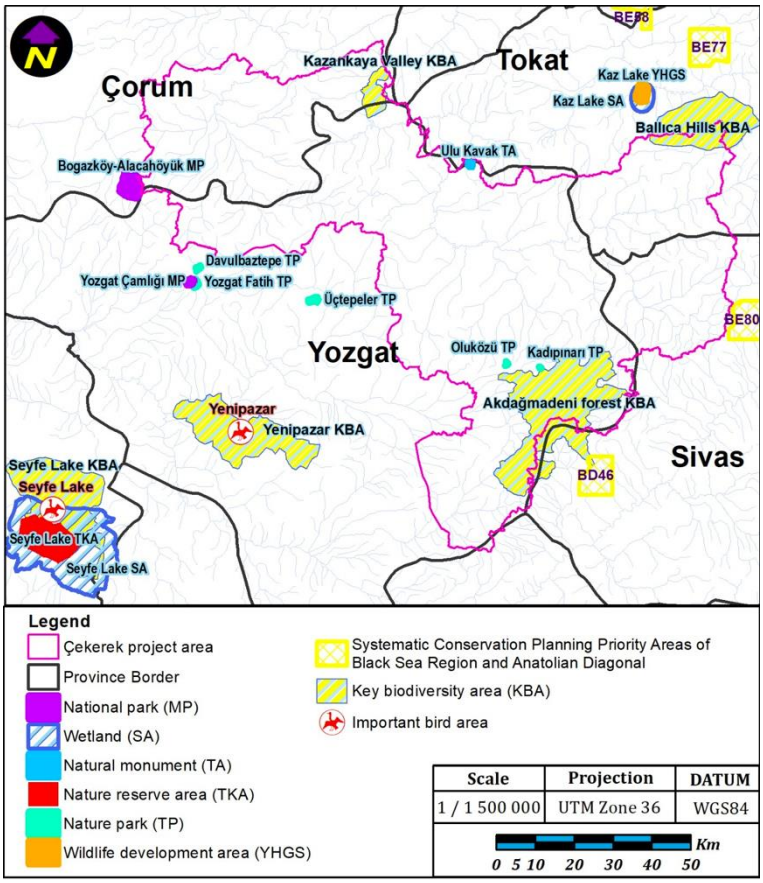

Figure 4-15. Biodiversity Hotspots and Protected Areas

A guideline is provided as a flowchart in Annex 4, which should be used by the managers of each sub-project to evaluate the presence of protected areas, nationally and internationally recognized conservation areas and critical habitats within the local study footprint area and additional affected areas. As a result of this evaluation, the necessity of preparing a

Biodiversity Management Plan for the given sub-project should be assessed, which will be presented as an assessment report.

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

Çekerek Basin project area does not contain any legally protected or nationally recognized wetland areas. However, during the field visit that took place on 22-25 September 2020, two wetland areas were visited near Sulusaray district, namely Uyuz Lake and Salt Lake wetlands. The responsible engineer from GDNCNP Tokat Provincial Department informed that, Uyuz Lake and Salt Lake were important sites for the common crane (*Grus grus*) (LC) besides other water birds. Uyuz Lake is observed to be under threat of water retake for irrigation of neighboring farmlands, as it was totally dry and drainage channels were observed. Salt Lake has become more like a marshland due to drainage channels built by State Hydraulic Works (DSİ) in the past years. These two lakes are not listed as officially recognized wetlands by the GDNCNP, although they may constitute critical habitats for the local and migratory bird species as personal communication with the officer for the Tokat National Parks Department, who informed us of the presence of these two lakes, suggested that these lakes provide habitat for the migratory birds, according to his field observations (Figure 4-16). Other similar wetlands, not recognized as critical habitats or under legal protection, can be present in the Çekerek Basin project area, which can be uncovered through following the guideline in Annex 4.

Figure 4-16. Uyuz Lake (upper two) is completely dry and Salt Lake (bottom)

Existing Environmental Infrastructure

Urban Sewerage System

In the basin, sewerage systems are mainly used in provincial centers. In rural areas, domestic wastewaters are collected in septic tanks or directly discharged into the tributaries of Çekerek River. According to the 2018 provincial environmental report, the current status of the wastewater treatment plants in the districts located in the Çekerek basin, are provided in Table 4-17 below. The table indicates that most of the wastewater treatment facilities are in planning or construction phase and are mainly planned for the urban zones.

At the majority of the Çekerek basin, water pollution is caused by agricultural activities and domestic wastewater discharge. Major industrial sources are located in Çorum Province. These industries treat their wastewaters in their own wastewater treatment plant before discharged to the Çorum/Alaca river (2018).

Figure 4-17 shows existing and planned wastewater treatments plants in Çekerek basin area.

Table 4-19. The current Status of the Wastewater Treatment Plants

		Whether There Is A Municipal Wastewater Treatment Plant			Municipal Wastewater Treatment Plant Type			Current Capacity (m3/day)
		Available	Planned/ Construction Phase	Unavailable	Physical	Biological	Advanced	
Yozgat	Aydıncık	X			X			450
	Çekerek		X					No data
	Kadışehri		X			X		600
	Saraykent		X			X		No data
	Akdağmadeni		X					No data
	Çayıralan		X					No data
Tokat	Artova		X			X		No data
	Sulusaray		X			X		No data
	Yeşilyurt		X					No data
Çorum	Alaca		X					2,987.52
	Ortaköy		X					382.08
Sivas	Yıldızeli		X					

Source: "Provincial Environmental Status Report" of Environment and Urbanization Provincial Directorate, 2018

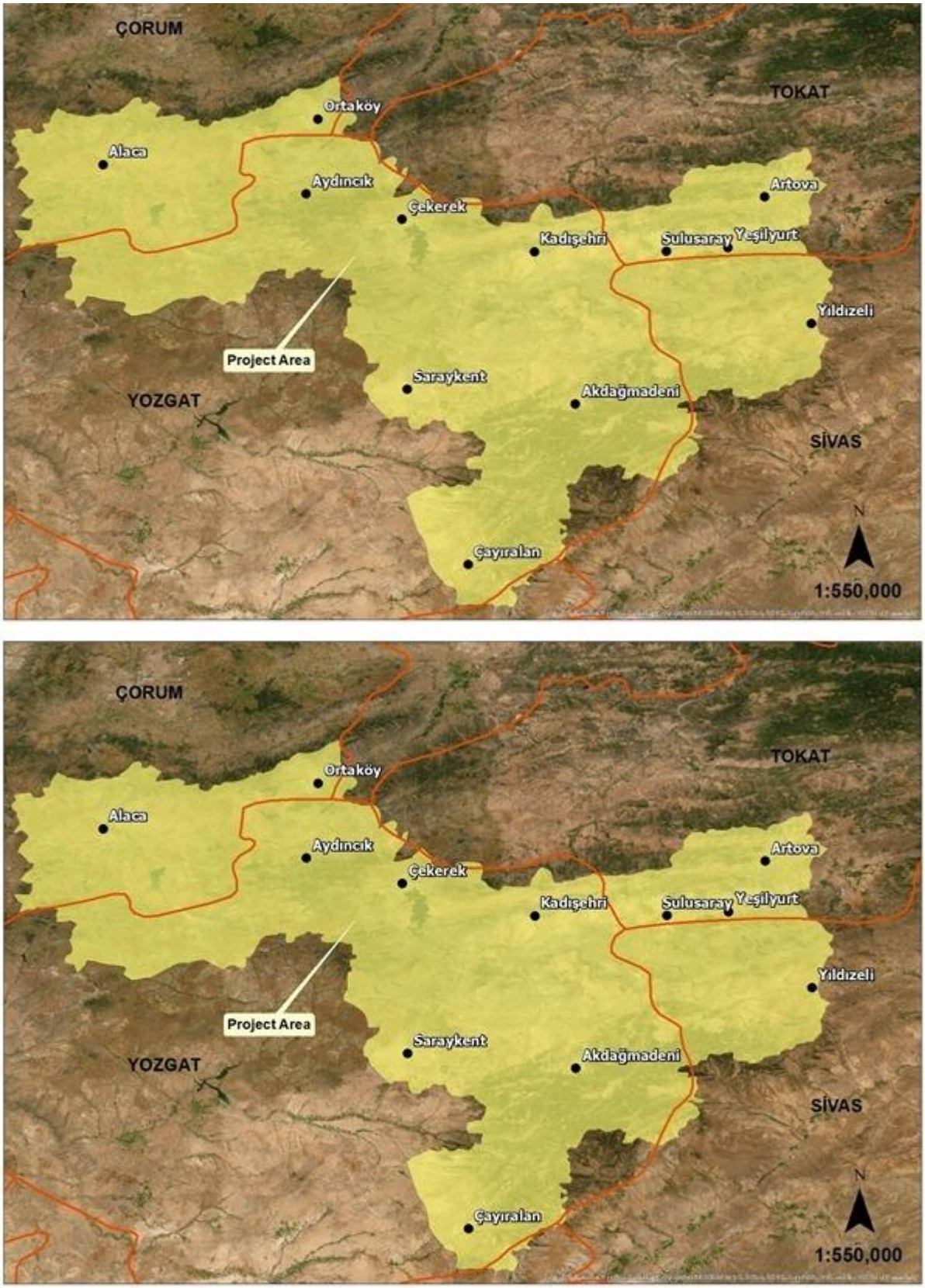

Figure 4-17. Geographic Location of the Çekerek River Basin

Source: Google Earth, Imagery Date: February 2019

4.2.2 Socio-Economic Baseline

Population

The CRB boundaries are located in four different provinces: Yozgat, Tokat, Çorum and Sivas. Almost three quarters of the provinces in the basin live in the provincial and district centers. However, this distinction was made according to administrative criteria and the socio-economic life of majority of the basin population is predominantly rural regardless of where they live.

In general, it is seen that the population of the basin is in a continuous and rapid decrease. The main reason for this trend is migration from basin provinces to other provinces in Turkey and abroad. For example, the population of Yozgat in the 2010s was lower than the population of 1965. However, Turkey's annual population growth rate per thousand in 2018 was 10.51 while the increase in Yozgat was (minus) -30.12, and it was (minus) -5.05 in Sivas. The population of Yozgat province has decreased by 250,359 people between 2000 and 2014. If Yozgat continues to lose its population at the same rate, this ratio is expected to be (minus) -42.47 in 2023. Although a similar trend is observed in all provinces in the basin, the reason why Yozgat is especially emphasized here is that 60.52% of the project area is within the borders of this province.

When the birth rate (per thousand) in the provinces of the Basin and Turkey between 2009 and 2019 is considered, the rate had been on the fall in all provinces of the Basin and in Turkey over the last ten years. However, this fall is more dramatic in the provinces of the Basin. The average rate in Turkey had fallen from 17,6 to 14,3 between 2009 and 2019. This fall was from 14,7 to 11,1 in Çorum; from 16,7 to 12,5 in Sivas; from 15.1 to 10,9 in Tokat and from 17.7 to 11.8 in Yozgat. The highest rate of fall in crude birth rate was recorded in Yozgat, as compared to other provinces in the Basin.

Total fertility rate refers to the average number of children a woman (aged between 15 and 49) can give birth. The total fertility rate had been falling dawn gradually between the years of 2009 and 2019 in Turkey in general and in the provinces of the Basin in particular. However, this rate of fall is more dramatic in the provinces of the Basin compared to the Turkish average.

Migration

According to the data of TurkStat (2007-2019), the migration rate of the provinces within the impact area of CRB Rehabilitation Project shows that they generally tend to lose population. According to the data of TurkStat (2019), the number of people living in other big cities, whose population records are in provinces within the area of Çekerek Basin Rehabilitation Project, is also high. 141,667 people registered in Yozgat live in Istanbul and 178,552 people live in Ankara. Most strikingly the number of people living in Istanbul who are registered in Sivas is 827,753 and the number of people living in Ankara again from Sivas is 418,174 according to the Address Based Population Census. It is seen that 499,026 people registered in Tokat registry live in Istanbul and 371,150 people registered in Çorum registry live in Ankara.

According to the data of TurkStat (2019), when the migrants are examined in terms of level of their education, it is seen that the education level of the provinces of the Çekerek Basin are higher as compared to rest of Turkey. This situation shows that migration causes a qualitative loss as well as quantitative, and that human capital of the Basin remain low in terms of education level. It is observed that migrant men are mostly high school/equivalent Vocational School graduates, a similar tendency is observed among women, but in Sivas, the number of high school or faculty graduates is higher than high school/equivalent Vocational School graduates amongst migrant from this city.

The biggest reason for the decrease in the Basin population is the rapid migration of the rural population. The following points can be listed as the reasons for migration from rural areas: (i) decrease in the monetary return of the economic activities in rural areas, (ii) lack of employment. The reasons such as the loss of yield in agricultural production, the fact that production depends on natural events, the shrinkage of arable lands through inheritance over time accelerated the escape from agriculture. Throughout the country,, (i) agriculture has traditionally been carried out as small family business, (ii) unpaid family labor is widespread, (iii) education level of the population working in agriculture is relatively low and unqualified. Besides, the unregistered and hidden unemployment characteristic of agriculture, the decrease in the rural population that has occurred have led to the unforeseen disintegration of the agricultural communities in the Basin since 2001 and one of the social costs of this trend is rising poverty and unemployment.

Age Groups

The age dependency ratio is a measure of the number of dependents aged zero to 14 and above the age of 65, compared with the total population aged 15 to 64. The proportion of the elderly population has increased due to migrations in the basin. The low fertility rate in the basin is also another reason of this increase as well. The proportion of population aged 65 and over in all districts is above the average of Turkey which is 9.1%. The proportion of the population in some districts is twice the average of Turkey (like Ortaköy 22.88%, Çayıralan 21.86%, Alaca 18.53%, Aydıncık 18.23% and Artova 17.86%).

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

Economy

In the provinces of the CRB, the economy is largely based on agriculture, animal husbandry and agriculture-based industry. The majority of the adult population (Age 15 and over) works in the agricultural sector. 45% of the total land in Çorum is suitable for agriculture. Only 15% of the arable land is irrigable agricultural land. The scarcity of irrigable agricultural land affects agriculture negatively. In Turkey, almost 25% of the agricultural land had been lost between 2004 and 2019. In the basin, the only province that experiences similar loss is Yozgat and the reduction of the agricultural land in Çorum was 13%. However, there was no significant reduction of agricultural area in Sivas and Tokat.

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

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

Socio-Economic Status

The limited social facilities in rural areas is another important reason for outgoing migration. Problems encountered in reaching social services such as education and health, sometimes difficulties in reaching even more basic needs such as food shopping are prevalent in the Basin. Due to development in modern communication technologies the deterioration or lack of social facilities in the region become more visible to local people. Above all low socio-economic

status associated with agriculture and animal husbandry accelerates social problems and outgoing migration trends in the region. It is expected that, as mentioned above, high proportion of people who are unpaid family workers, housewives or unemployed would have an impact on the socio-economic status of the people in the Basin. Another likely factor that would have an impact on the socio-economic status of the Basin and its people is the age dependency. The elderly population dependency in the Basin has been increasing since 2007 and by the end of 2019 this increase has been almost three times higher than the average increase in overall Turkey.

According to TurkStat data, there is a population of over one million in the basin that is subject to unpaid employment (72% is woman). In the Basin, economically inactive population (65 years and above) is much higher than the average of Turkey's population in the Basin while education level of the population is also below Turkey's average. According to the report prepared by State Planning Organization in 2014, a ranking was made among 872 districts in Turkey for their level of socio-economic development. According to this report, SES levels of districts in the basin were relatively low compared to other districts in Turkey. In this study socio-economic level measured by using variables including demographics, employment, education, healthcare, industry, agriculture, construction, finances and other indicators of well-being. Using these indicators, settlements were ranked from high to low as well as grouped in six different categories with the first group having the highest well-being indicators and the sixth is the lowest. Apart from Yozgat Central District all other districts in the Basin fell into the low group categories. The current studies also highlight the lower SES in the Basin Provinces.

The Socio-Economic Development Ranking Survey of the Ministry of Industry and Technology dated 2017 ranks the regions and provinces according to variables such as demography, employment, education, health, competitive and innovative capacity, financial, accessibility and quality of life. This ranking gives the provinces the rank among the 81 provinces and is subject to a ranking between 1 (highest) and 6 (lowest) based on the average score the province has received. While provinces in the basin are in the 4^{th} and 5^{th} tiers, the average scores of the basin provinces are very low. For example, the average score of Istanbul in the first tier is 4,051. Again, at the same level, Ankara's score is 2,718 and the score of Izmir is 1,926. Average scores of provinces in CRB: Çorum, -0.262; Sivas, -0.137; Tokat, -0.381; and Yozgat, -0.589.

Vulnerable Groups

As the agricultural laborers move around the country as family units including the children, child labor in the agricultural sector is an integral part of the seasonal agricultural workers.The Seasonal Agricultural Work Survey in Turkey (2014) indicates Yozgat as one of the cities receiving regular seasonal agricultural workers during the sugar beet hoeing season. The researchers also came across relatively few Syrian refugees in the rural areas of Yozgat where sugar beet is a major production and one of the main sources of seasonal labor. As mentioned above very few Syrian refugees were used in agriculture as wage laborers in the Basin. According to current data provided by the Directorate General of Migration Management (September 2020) in Turkey, residence permission was granted to 932 066 people coming from countries such as Afghanistan, Iraq, Turkmenistan, Syria, Azerbaijan, and Iran.

5 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

5.1 Potential E&S Impacts of Proposed Sub-Projects

This section identifies the potential environmental and social impacts that could arise from the activities of the sub-projects either during the construction phase or the operational phase.

Despite several common generic impacts, sub-projects may pose distinct impacts, which will be assessed within the scope of site-specific E&S assessment (i.e. ESIA, ESMP, etc.). Mitigation measures will be developed in order to avoid, reduce or compensate for the impacts identified in these reports.

5.1.1 Potential Impacts for Sub-Component 1.1 Green infrastructure and sustainable livelihoods

(a) Forest landscapes and livelihoods upstream

- Small-scale erosion, landslide, and flood control works upstream,
- Forest rehabilitation and sustainable management
- Forest pasture rehabilitation and sustainable management
- Income generation and livelihood diversification for forest villages

(b) Sustainable and climate-smart agriculture and value chains

- Sustainable and climate-smart agricultural practices,
- Pasture rehabilitation and sustainable management outside forest lands,
- Agricultural diversification, and sustainable value chains for rural villages.

General, cross-cutting potential environmental and social impacts, which could be expected for all sub-projects, are presented below.

Table 5-1. Indicative List of Impacts of Components 1.1 and 1.2

Issue	Construction Stage	Operation Stage
Small scale erosion, landslide and flood control works upstream		
Erosion control, landslide and flood control structures in the upper basin landscape such as: Galvanized treillage, Mortared Levees; Gabion Box Wall; Steel Debris Barrier; Retaining Wall; Vents; In-line Grout; Reclamation Bench; Wire Mesh Wall	• Construction waste and debris • Noise from machinery • Occupational health and safety • Community health and safety (employment of forest villagers) • Land acquisition • Interruption in the use of access roads • Disturbance on wildlife • Exclusion of certain groups in targeting disadvantaged and vulnerable groups • Child labor risks	Green infrastructure interventions comprise of nature-based solutions, so the impacts are mostly positive. Still, possible adverse impacts should be avoided, such as: • Blockage of wildlife routes and fragmentation • Impacts on aquatic wildlife, migratory fish stocks • Impacts on riparian ecology • Impacts on river flow rate • Changes in riverbed • Loss of habitat • Disturbance on wildlife

Issue	Construction Stage	Operation Stage
	• Risks with seasonal workers accommodation and working conditions	• Loss of natural resources • Landscape Character Analysis will be conducted in relation with the European Landscape Agreement • Water rights of downstream communities • Child labor risks
Income generation and livelihood diversification for forest villages		
Supporting livestock breeding around the forest areas, grazing in pastures will be facilitated by building animal shade, saltshaker, scratching post, drinker, barn, sheep bath, wire cage thresholds, wooden thresholds. Use of pesticides, fertilizers, artificial seeding, stone cleaning, Ecosystem reservoirs	• Dust and noise from excavation works • Workers' health and safety • Child labor risks • Community health and safety, including sexual exploitation and harassment • Interruption in the use of access roads • Disturbance to wildlife • Health and environmental risks associated with the use of pesticides	• Nitrate leaching due to increased livestock grazing capacity • Groundwater pollution, surface water pollution, soil contamination from increased manure deposition • Habitat destruction from over-population of animals using pasture lands. • Community health and safety risks (i.e. drowning) • Disturbance to wildlife • Infectious diseases which may occur due to dead animals in the reservoirs. • Child labor risks • Health and environmental risks associated with the use of pesticides
Forest rehabilitation and sustainable management		
Improvement of existing roads (ca. 897 km)	• Dust and noise • Community health and safety risks due to employment • Occupational health and safety for the unskilled labor force (working on steep slopes and use of machinery) • Disturbance of wildlife and habitats • Landslides triggered due to increased slopes from road extension works • Livelihoods on project site or on right of way.	• Increased risk of landslides • Increasing pressure on the forest by allowing unauthorized users reaching deep into the forest
Maintenance of Young Forests 5730 ha	• Occupational health and safety for the unskilled labor force (working on high slopes and cliffs and use of machinery) • Community health and safety, including sexual exploitation and harassment • Child labor risks • No proper working conditions in terms of sanitation for the work-force • Risks related to traffic accidents caused by daily transfer for many people to reach the work site • Disturbance of wildlife • Disturbance of habitat	• No significant impacts/risks.
Income generation and livelihood diversification for forest villages		

Issue	Construction Stage	Operation Stage
Recreational areas (with daily social facilities of different scales); Ecotourism Projects	• Disturbance of wildlife • Noise	• Waste and wastewater generation • Increased grazing pressure on the pasture lands • Nuisance on wildlife
Grant scheme aiming to promote livestock breeding	**First Year of Implementation** • Disturbance of habitats • Increased manure generation • Increased water consumption • Increased grazing pressure on the pasture lands	**Consecutive implementation years** • Disturbance of habitat • Increased manure generation • Increased water consumption • Increased grazing pressure on the pasture lands
Grant scheme for installation of greenhouses	No significant impacts.	• Vegetable wastes that will arise after harvest • Pollution generated from plastic materials to be used as greenhouse cover • Changes in the customs of production
Income generating species afforestation (240 ha) Honey forest project (346 ha) Medical Aromatic Plant Cultivation	• Unskilled labor force health and safety (working on high slopes and cliffs and use of machinery) • Community health and safety, including sexual exploitation and harassment • No proper working conditions in terms of sanitation for the work-force • Risks related to traffic accidents caused by daily transfer for many people to reach the work site • Disturbance of wildlife • Disturbance of habitat	• Loss/disturbance of critical habitats and possible endemic/endangered/rare species
Sustainable and climate-smart agricultural practices		
Creation of modern hazelnut groves on terraces	• Community health and safety risks in terracing works due to mobilizing the farmers for small construction works. • Health and environmental risks associated with the use of pesticides • Child labor • Land acquisition and livelihoods impacts	• Increased risk of landslides (if proper rainwater drainage system not installed on the terraces)
Grant scheme for installation of greenhouses	• Community health and safety risks	• Vegetable wastes that will arise after harvest • Pollution created from plastic materials to be used as greenhouse cover • Changes in the customs of production

As part of the TULIP project, NBS will be considered in the set of integrated green and gray investments in the forestry, agriculture, water and transport sectors. This includes the finance of upstream measures in the river basin by OGM to reduce flooding, erosion, sedimentation and landslides, enhance irrigation and improve water quality, and reduce droughts. Solutions include (but are not limited to) protection, rehabilitation, and sustainable management of

forests and pastures, afforestation, and the implementation of water retention and erosion-control works that increase the amount of vegetation and infiltration capacities, retain storm water and reduce run-off speed, resulting in a decrease of flood and erosion risk. In addition, sustainable and climate-smart agricultural practices supported by the project and implemented by TGRM can include NBS such as rainwater harvesting, terracing, and measures to reduce irrigation demands by improving soil water retention capacities. NBS upstream in the river basin can complement investments implemented by DSI, including dams and multipurpose reservoirs, drinking water infrastructure systems and flood and sedimentation control structures. Effective NBS upstream, such as natural floodplains and water retention measures, can support gray flood control structures and embankments downstream. Conservation of watersheds that are surrounding water sources will also naturally filter pollutants, as well as trap sediment in rivers, reducing erosion, and flow of sediments into reservoirs and drinking water supplies, which will affect the performance requirements of water treatment facilities.

NBS can be introduced in conjunction with the grey investments. NBS are mostly positive in terms of environmental and social impacts. As for the grey investments, besides generic indicative impacts of construction works, a series of specific impacts can be designated, such as:

Small-scale erosion, landslide, and flood control works

- OGM will employ community workers in its sub-projects associated with possible risks such as working at height and high slopes; daily off-road driving for mass transportation of workers, wildlife encounters, etc. Given that communities are not skilled in such works this will be a risk to be managed. Site conditions for male and female labor force can be highly risky due to lack of sanitary facilities, risks of sexual abuse, presence of children together with families working on the sites, etc.

Ecosystem reservoirs

- High amounts of topsoil will be stripped, and excavation will be carried out for the ecosystem reservoirs leading to need for good management of top soil.
- Possible impacts on groundwater aquifers.
- Community risks of falling and drowning in the reservoirs due to the sliding geo-membrane lining.

Rehabilitation project of pastures inside forests

Use of village shepherds is not a common practice in Black Sea villages. Instead, livestock grazers tend to stay on the pasture lands and construct illegal shelters/housings. Invasion of pasturelands by newcomers may exert pressure on pasture quality.

Improvement of forest roads in the basin

- The common practice in rehabilitation of forest roads is by use of direct excavation and earthworks, which in turn increases landslide risks. Non-engineered construction works with no supervision could exacerbate the risks.

- Increased penetration into forests as a result of increased quality of access roads, may lead to poaching, opening of new roads, increased fire risks, disturbance on wildlife, etc.

Grant schemes for greenhouses and livestock

- Cumulative impacts may occur as similar grants are planned by both OGM and TRGM. The cumulative impact issues may include management of vegetable wastes in greenhouse projects and manure deposition in livestock sub-projects. Uncoordinated siting and planning of the grant schemes may pose additional cumulative impacts.

Income generating species afforestation (240 ha), honey forest project (346 ha), medical aromatic plant cultivation

- Poor siting of plant cultivation areas may put risks on critical habitats, rare, threatened and endangered flora and fauna species.

Modern hazelnut groves with terracing

- Terracing works will require removal of hazelnut trees. The newly planted hazelnuts will require at least 5 years before yielding any crop.. Due to lack of compensation budget in the relevant grant component, beneficiary farmers will lose their livelihoods for a certain time period unless mitigation/compensation measures are put in place. Beneficiary farmers will be given priority in grants as a means of compensation.

5.1.2 Potential Impacts for Sub-Component 1.2 Resilient Gray Infrastructure

(a) Resilient infrastructure for water security

- Dams and small-scale multipurpose reservoirs
- Irrigation works
- Flood and sedimentation control structures

(b) Resilient mobility

- Resilient rural road rehabilitation

General, cross-cutting potential environmental impacts, which could be expected for all sub-projects, are presented below.

Table 5-2. Indicative List of Impacts and Risks of Sub-Component 1.2

Issue	Impacts during Construction Stage	Impacts during Operation Stage
Dams and small-scale multipurpose reservoirs		
Water storage structures for irrigation, irrigation dam, irrigation facilities and channels (Çekerek)	• Dust emissions • Noise from machinery • Waste generation from labor force • Wastewater from labor force • Construction debris • Workers OHS • Labor conditions (including child labor) • Community health and safety, including sexual exploitation and harassment	• Noise from pumping stations • Environmental flow for communities • Environmental flow for aquatic life in the river

Issue	Impacts during Construction Stage	Impacts during Operation Stage
	• Potential land acquisition • Interruption in the use of access roads due to heavy vehicle traffic • Disturbance caused by closed roads construction of open trenches on the road systems • Disturbance of natural habitats • Disturbance of ecosystem services (possible damage on forest lands, hazelnut plantations, etc.)	
Small-scale multipurpose reservoirs	• Dust • Noise from machinery • Occupational Accidents • Waste generation from labor force • Excavation and construction waste • Wastewater from labor force • Construction debris • Occupational health and safety • Labor influx • Labor conditions (including child labor) • Community health and safety, including sexual exploitation and harassment • Potential land acquisition • Interruption in the use of access roads due to heavy vehicle traffic • Disturbance caused from closed roads and construction of open trenches on the road systems • Disturbance of natural habitat Associated Facilities Stone/Clay/Sand Pits and Access Roads: • Dust and noise • Water consumption • Disturbance to vegetation • Exhaust gas from heavy duty vehicles • Damage to ecological landscape • Disturbance of ecosystem services (possible damage on forest lands, hazelnut plantations, etc.)	• Impacts on aquatic biodiversity • Impacts on riparian ecology • Impacts on river flow rate and basin hydrology • Environmental flow (for communities and ecosystems) • Water rights of downstream communities • Hindered movement and migration of fish • Increased siltation • Increased surface water pollution due to decreased flow-rate water downstream • Dam safety risks
Flood and sedimentation control		
Walled channels Stone fortifications Culverts Bridges	• Dust • Waste generation from labor force • Wastewater from labor force • Construction debris	• Impacts on aquatic biodiversity • Impacts on riparian ecology • Impacts on river low rate and basin hydrology

Issue	Impacts during Construction Stage	Impacts during Operation Stage
River bed rehabilitations Fortified embankments Reverse dam Levees Reinforced concrete channels along both sides of the river will be constructed. Vent renewal Stream bed management Grouted stone pitching	• Noise from machinery • Workers health and safety • Community health and safety, including sexual exploitation and harassment • Labor influx • Potential land acquisition • Interruption in the use of access roads • Labor conditions (including child labor)	• Water rights of downstream communities • Loss of habitat • Insignificant Loss of ecological services • Hindered movement and migration of fish
Resilient rural road rehabilitation		
45 km of bituminous and/or hot mix coating road construction (Bolaman)	• Dust • Noise from machinery • Vibration • Surface water contamination • Excavated soils • Debris • Workers health and safety • Labor conditions (including child labour) • Community health and safety, including sexual exploitation and harassment • Potential land acquisition and possible economic resettlement • Interruption in the use of access roads Associated Facilities Stone/Clay/Sand Pits: • Dust and Noise • Water Consumption • Disturbance to vegetation • Exhaust gas from heavy duty vehicles • Damage to ecological landscape	• Disturbance of habitats • Increased side slopes • Increased risks of landslides and erosion • Loss of livelihoods on sides of existing roads • Noise and dust from increased traffic • Increased accident rates due to speeding in rehabilitated roads causing loss of life and property, animal crush Associated Facilities Stone/Clay/Sand Pits: • Disturbance to vegetation • Continued damage to ecological landscape if not rehabilitated.

Besides generic indicative impacts of construction works, a series of specific impacts can be designated, such as:

Climate-resilient rural road rehabilitation

- Rehabilitation works regarding road improvements, water pipeline, large flood control elements and water storage structures will require materials such as sand and gravel, which trigger need for supply from a series of pits and quarries. Operation of pits and quarries calls for additional requirements for environmental and social safeguards. Given the already existing quarry facilities, cumulative impacts would be of concern as related with regional visual aspects as well as dust and noise generation and water consumption. Construction waste and debris could be reused as fill material in road

improvement works, which would significantly decrease the costs of waste management and diminish the need for quarries and associated costs of mitigation measures. Cooperation between IAs would establish the essential links for a circular economy and integrated natural resource management.

- Water supply projects comprise of construction of new water storage structures that may trigger dam safety risks and also end-up in increased power consumption. Any network leak detection would help saving water resources, costs and energy while more water would be available to consumers. Leakage generally occurs at faulty pipe joints or at points of defects in the pipeline. If leaks are not detected on time, electric power to run the pumps and chemicals to treat water would be wasted.
- Sustainability of urban water management is constrained by conventional systems. Significant cost saving would be achieved if treatment of water resources was given a priority. Hence water would be supplied from clean water resources rather than investing in high-cost water treatment solutions.
- Landslide control works could remain inefficient unless detailed site assessments are performed for identifying critical spots. There is always the risk that landslide control measures may trigger further risks of landslides unless well-planned. A detailed assessment would be focused on the transportation routes and road corridors.

Sub-project specific ESMPs should refer to the above-mentioned impact issues in detail.

5.2 E&S Mitigation Measures

A general mitigation plan for sub-projects covering possible impacts of sub-projects identified in the preceding section is given in Table 5.3 below. These mitigation measures are required to be incorporated into the preparation of site specific ESIAs/ESMPs of the sub-projects. Further mitigation measures should be added based on additional studies/surveys to be performed, i.e. hydrological modelling, biodiversity surveys, etc.

Depending on the site characteristics and final designs, there will be additional mitigation measures relevant to project specific impacts.

Additionally, a generic monitoring plan including the parameters corresponding to each potential adverse impact is presented in Table 5.4.

Table 5-3. Mitigation Plan

Mitigation of Impacts and Risks from Sub-Component 1.1 (a) Forest landscapes and livelihoods upstream

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Landslide control, pastureland management, ecosystem reservoirs, service roads, equipment procurement, warehouse construction, surrounding walls, PV, solar water heating, recreational facilities, fruit trees, greenhouses, livestock breeding, bee keeping, bakeries				
Design Stage				
Biodiversity and sensitive areas	• Avoid interference with critical habitats and sensitive/important areas (in natural habitats, protected areas, nationally and/or internationally recognized areas of biodiversity importance) as well as culturally sensitive areas during sub-project site selection. (See Sections 4.1 and 4.2 for potential critical habitats, protected areas, nationally and/or internationally recognized areas of biodiversity importance). • Ensure that forest rehabilitation and afforestation projects include a mix of native species (not monocultures of commercially valuable species), and take a landscape/habitat approach.	Included in design, no additional cost.	OGM	
Sustainability of measures for controlling risks of landslides, erosion	• Ensure engineering designs are in place based on site surveys on risk areas. • Incorporate nature-based solutions into engineering designs, as applicable • Designate locations where control measures will be implemented.	Included in design, no additional cost.	OGM	
Sustainability of pasturelands	• Ensure cooperation of OGM and TRGM in order to prepare a Grazing Management Plan with a holistic approach and participatory decision making. The management plan will be inclusive of all grazing areas in the project areas (both for Çekerek and Bolaman Project Area). • Ensure that livestock grants are coordinated with the Grazing	Included in design, no additional cost.	OGM TRGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	Management Plan			
Waste and wastewater from increased tourism activities	• OGM will ensure close cooperation with Ordu Metropolitan Municipality, OSKI and Ordu Provincial Directorate of Environment and Urbanization, in order mitigate possible impacts associated with increased waste and wastewater loads from increased tourism activities within the scope of the Project. • An agreement will be signed with Ordu Metropolitan Municipality and/or district municipalities for securing collection of wastes and wastewater (possibly in cesspits) from the recreational spots and facilities. • OGM and TRGM will cooperate with Ordu Regional Directorate of Nature Conservation and National Parks and Provincial Directorate of Culture and Tourism for a better integrated planning for increased income from tourism, while protecting natural and cultural resources. • OGM and TRGM will ensure coherence with “Nature Tourism Master Plan for Ordu Province, 2013-2023” and “Eastern Black Sea Tourism Master Plan”.	Included in design, no additional cost.	OGM	
Community risks of falling and drowning in the reservoirs	• Ensure surround fences are included in the designs.	Included in design, no additional cost.	OGM	
Community Health and Safety and Occupational Health and Safety	• Assess the infrastructure and equipment design and ensure measures are incorporated as per ESS4 • Prepare Pest Management Plan for possible application of pesticides in new plantations	Included in design, no additional cost.	OGM	
Labor force	• OGM and TRGM will cooperate to ensure full implementation of Labor Management Procedures (LMP) for the Project. • OGM and TRGM will ensure that project-specific LM Plans in compliance with the project level LMP, comprising in particular, of:	Included in design, no additional cost.	OGM TRGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	- Age and social security verification system for the employment procedure - Obligatory OHS Trainings - Monitoring visits to project sites - Grievance Mechanism - OHS compliant work sites			
Vegetable wastes in greenhouse grant projects	• Ensuring coordinated management of grant projects. • Coordination between OGM and TRGM for integrated management of vegetable wastes. • Preparation of a feasibility study for processing/recycling of vegetable waste (and marketing study in case of i.e. composting, etc.)	Included in design, no additional cost.	OGM TRGM	
Social conflicts	• OGM and TRGM will endorse a joint policy to prevent social conflicts that may rise as a result of sharing scarce grazing resources. • A Grant Management Procedure will be prepared by OGM and TRGM, including objective evaluation criteria for distribution of grants among communities and community members. • Grazing Management Plan should account for social conflicts as well.	Included in design, no additional cost.	OGM	
Sustainability of beekeeping activities	• OGM and TRGM will cooperate with Ordu Beekeeping Research Institute for better planning and implementation of their sub-projects.	Included in design, no additional cost.	OGM	
Stakeholder engagement	• Stakeholder Engagement Plan to be prepared for each sub-project including a Grievance Mechanism (GM), through which stakeholders' concerns and complaints will be addressed.	Included in design, no additional cost.	OGM	
Pre-Construction Stage				
Environmental and Social Issues (Generic)	• Prepare the following sub-project-specific management plans: - Environmental and Social Management Plan (if appropriate) - Biodiversity Management Plan	Included in design, no additional cost.	OGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	- Waste Management Plan - Pesticide Management Plan - Occupational Health and Safety Plan - Community Health and Safety Plan - Labor Management Procedure - Pesticide Management Plan - Stakeholder Engagement Plan Resettlement Plan -			
Employment of community workers in erosion, landslide, and flood control works	• OHS Training for community workers. • Ensuring contracts are prepared for employing community workers, clearly indicating labor conditions and protecting worker rights in line with the Labor Management Procedure.	Included in design, no additional cost.	OGM	
Biodiversity	• Prepare Biodiversity Management Plans for projects on or near critical habitats in natural habitats, protected areas, nationally and/or internationally recognized areas of biodiversity importance (for cases that avoidance not possible during site selection)	Included in design, no additional cost.	OGM	
Construction Stage				
Environmental and Social Issues (Generic)	• Implement the following sub-project-specific management plans: - Environmental and Social Management Plan - Biodiversity Management Plan - Waste Management Plan - Pesticide Management Plan - Occupational Health and Safety Plan - Community Health and Safety Plan - Labor Management Plan - Pesticide Management Plan - Stakeholder Engagement Plan - Resettlement Plan • Ensure that each management plan uses nature-based solutions, as possible.	Included in design, no additional cost.	OGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Loss of topsoil	• High amounts of topsoil will be stripped, and excavation will be carried out for the ecosystem reservoirs leading to need for good management of top soil.	Included in design, no additional cost.	OGM	
Biodiversity	• Implement the Biodiversity Management Plan for both natural and critical habitats • Ensure forest rehabilitation and afforestation projects include a mix of native species (not monocultures of commercially valuable species), and take a landscape/habitat approach.	Included in the planning cost. No additional cost.	OGM	
Community workers in erosion, landslide, and flood control works.	• Ensuring of basic sanitary conditions for all labor force, particularly for the female workers. • Ensuring road safety for transportation of workers to-and-from project sites. • Ensuring security of workers (wildlife encounters, sexual abuse and harassment, etc.)	Included in the planning cost. No additional cost.	OGM	
Increased penetration into forests as a result of increased quality of access roads	• Ensuring current security measures are enhanced to account for the uncontrolled trespassers and poachers into the forests. • Ensuring increased control against illegal opening of new access routes. • Ensuring increased control of fire risks imposed by increased fire risks from increased access into the forests. • Ensuring increased control of wildlife from increased human activities within forest areas.	No additional cost. Cost included in contract price.	OGM	Tender and contract documents
Operation Stage				
Environmental and Social Issues (Generic)	• Implement the following sub-project-specific management plans: - Biodiversity Management Plan - Waste Management Plan - Pesticide Management Plan - Occupational Health and Safety Plan - Community Health and Safety Plan - Labor Management Plan - Pesticide Management Plan	Included in design, no additional cost.	OGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	- Stakeholder Engagement Plan - Resettlement Plan			
Biodiversity	• Implement the Biodiversity Management Plan for both natural and critical habitats	Included in the planning cost. No additional cost.	OGM	
Community HS and Workers HS	• Implement the Pest Management Plan for possible application of pesticides in new plantations	Included in design, no additional cost.	OGM	
Community risks of falling and drowning in the ecosystem reservoirs	• Security fencing to restrict public entry to dangerous areas during maintenance periods. • Provide adequate signage to warn public of any dangers. • Learning/Training campaigns to sensitize community residents about the risks of drowning in the reservoirs.	Included in design, no additional cost.	OGM	
Occupation of pasture lands by increased livestock grazers	• Control illegal occupation of pasturelands by means of increased engagement and dialogue with communities and increased enforcement.	Included in design, no additional cost.	OGM	
Landslide risks triggered by road extension works	• Regular site investigations for slope stability at road sides.	Included in design, no additional cost.	OGM	

Mitigation of Impacts and Risks from Sub-Component 1.1 (b) Sustainable and climate-smart agricultural practices and value chains

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Greenhouses, hazelnut groves, fruit trees, mushroom, pocket terracing, good agriculture, livestock breeding, shepherd houses, barns, geese, beekeeping, pasture organization, etc.				
Design Stage				
Biodiversity and sensitive areas	• Avoid interference with critical habitats and sensitive/important areas (in natural habitats, protected areas, nationally and/or internationally recognized areas of biodiversity importance) including culturally sensitive areas during sub-project site selection	Included in design, no additional cost.	TRGM	
Vegetable wastes in greenhouse grant projects	• Ensuring coordinated management of grant projects. • Coordination between OGM and TRGM for integrated management of vegetable wastes. • Preparation of a feasibility study for processing/recycling of vegetable waste (and marketing study in case of i.e. composting, etc.)	Included in design, no additional cost.	OGM TRGM	
Community HS and Workers HS	• Prepare Pest Management Plan for possible application of pesticides in new plantations	Included in design, no additional cost.	OGM	
Social conflicts	• OGM and TRGM will endorse a joint policy to prevent social conflicts that may rise as a result of sharing scarce grazing resources. • A grant management procedure will be prepared by OGM and TRGM, including objective evaluation criteria for distribution of grants among communities and community members.	Included in design, no additional cost.	OGM TRGM	
Labor force	• OGM and TRGM will cooperate to ensure full implementation of Labor Management Procedure (LMP) for the Project. • OGM and TRGM will ensure that project-specific Labor Management Plans in compliance with the LMP, comprising in particular of: • Age and Social Security verification system for the	Included in design, no additional cost.	OGM TRGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	employment procedure • Obligatory OHS Trainings • Monitoring visits to project sites • Grievance Mechanism • OHS compliant work sites			
Sustainability of beekeeping activities	• OGM and TRGM will cooperate with Ordu Beekeeping Research Institute for better planning and implementation of their sub-projects.	Included in design, no additional cost.	TRGM OGM	
Sustainability of value chain approach.	• OGM and TRGM will cooperate during planning stage for applying the value chain approach. • OGM will ensure joint implementation with TRGM in order to achieve sustainability of its sub-projects that include non-hazelnut crop production.	Included in design, no additional cost.	TRGM OGM	
Stakeholder engagement	• Stakeholder Engagement Plan to be prepared for each sub-project including a GM, through which stakeholders' concerns and complaints will be addressed	Included in design, no additional cost.	TRGM	
Cultural Heritage	• Chance Finds Procedure for potential tangible cultural heritage Documenting intangible cultural heritage if discovered during project activities, by recording the intangible forms and collecting documents that relate to them.	Included in design, no additional cost.	TRGM MoCT	
Pre-Construction				
Environmental and Social Issues (Generic)	• Prepare the following sub-project-specific management plans: - Environmental and Social Management Plan - Biodiversity Management Plan - Waste Management Plan - Pesticide Management Plan - Occupational Health and Safety Plan - Community Health and Safety Plan - Labor Management Plan	Included in design, no additional cost.	OGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	- Pesticide Management Plan - Stakeholder Engagement Plan - Resettlement Plan • Ensure that each management plan uses nature-based solutions, as possible.			
Community health and safety risks in terracing works due to mobilizing the farmers for small construction works.	• OHS Training for community workers. • Ensuring contracts are prepared for employing community workers, clearly indicating labor conditions and protecting worker rights.	Included in design, no additional cost.	TRGM	
Construction				
Environmental and Social Issues (Generic)	• Implement the following sub-project-specific management plans: - Environmental and Social Management Plan - Biodiversity Management Plan - Waste Management Plan - Pesticide Management Plan - Occupational Health and Safety Plan - Community Health and Safety Plan - Labor Management Plan - Pesticide Management Plan - Stakeholder Engagement Plan - Resettlement Plan	Included in design, no additional cost.	OGM	
Operation				
Environmental and Social Issues (Generic)	• Implement the following sub-project-specific management plans: - Environmental and Social Management Plan - Biodiversity Management Plan - Waste Management Plan - Pesticide Management Plan - Occupational Health and Safety Plan - Community Health and Safety Plan - Labor Management Plan	Included in design, no additional cost.	OGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	- Pesticide Management Plan - Stakeholder Engagement Plan - Resettlement Plan			
Risk of landslides	• Ensuring proper rainwater drainage system is installed on the terraces.	Included in design, no additional cost.	TRGM	Tender and contract documents
Occupation of pasture lands by increased livestock grazers	• Control illegal occupation of pasturelands by means of increased engagement and dialogue with communities and increased enforcement.	Included in design, no additional cost.	TRGM	
Livelihoods of hazelnut farmers affected for the 5-years period of re-growth	• Ensuring that affected farmers are compensated for their economic loss until they can start harvest again.	Included in design, no additional cost.	TRGM	
Cultural Heritage	• Chance Finds Procedure for potential tangible cultural heritage • Documenting intangible cultural heritage if discovered during project activities, by recording the intangible forms and collecting documents that relate to them.	No additional cost.	TRGM MoCT	

Mitigation of Impacts and Risks from Sub-Component 1.2 (a) Resilient infrastructure for water security

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Dams and small-scale multipurpose reservoirs, Small-scale storage structures, irrigation works, flood and sedimentation control structures				
Design Stage				
Community Health and Safety	• For large dams−that is, dams that are 15 meters or more in height, or are between 10 and 15 meters and present special design complexities (e.g., an unusually large flood-handling requirement, location in a zone of high seismicity, or foundations that are complex and difficult to prepare): • ensure that reviews are made by an independent panel of experts during the design stage (panel of experts should be hired one month prior to starting feasibility studies). • Plan dam safety measures as an integrated part of the ESIA Reports for the water retention structures as long as they are not screened out during initial screening. • Prepare construction supervision and quality assurance plan, instrumentation plan, outline of operation and maintenance plan, and framework emergency preparedness plan. • • Specific measures for each reservoir/dam will be described in the relevant ESMPs.			
Biodiversity and sensitive areas	• Avoid interference with critical habitats and sensitive/important areas (in natural habitats, protected areas, nationally and/or internationally recognized areas of biodiversity importance) as well as culturally sensitive areas during sub-project site selection. • Analyze scenarios associated with different locations, designs, and release regimes to assess the risks; determine the extent of deviation from the ecological and social baseline. • Incorporate ecological restoration interventions into the designs (i.e. riparian ecosystems, etc.)	Included in design, no additional cost.	DSI	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	• Maximize use of nature-based solutions in ecological restoration			
Aquatic ecosystem and environmental flow	• Engage with local people for their inputs to assessment of environmental flows • Ensure designs are inclusive of adequate environmental flow is ensured for downstream communities and sustainability of aquatic biodiversity • Ensure fish passages are incorporated in the reservoir/dam designs • Apply hydrological and hydraulic assessment methods that use summary statistics from hydrological data sets, such as a percentile from the annual flow duration curve, or the lowest recorded flow, to set a “minimum flow” for the river. • Address the condition of the whole river ecosystem, including individual species or guilds in the channel, the riparian zones, floodplains and estuary where relevant. • Ensure that social issues are equally considered in setting the minimum flow. • Commit full release of river flow regardless of the set minimum flows, as necessary (i.e. drought periods) • Ensure that real-time environmental flow monitoring is a component of dam and water reservoir sub-projects. • Prohibit sand/aggregate mining from rivers/river banks.	Included in design, no additional cost.	DSI	
Sustainability of water supply system	• DSI will establish the baseline conditions at all target resources in joint effort with Ordu Metropolitan Municipality, OSKI and Provincial Directorate of Environment and Urbanization in order to develop an Action Plan prioritizing the protection of the clean water intake zones of the DSI investments. • DSI will cooperate with OSKI in order to start a leak detection programme on the supply system to avoid loss of water and load on the water resource. • DSI will ensure that water storage structures will be designed to allow for migration of fish in the tributaries. Detailed ecosystem	Included in design, no additional cost.	DSI	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	surveys will be performed for aquatic ecosystem in the area of influence. • DSI will perform a hydrological modelling study of Bolaman River and its tributaries will be performed in order to assess and mitigate the impacts of water storage structures on downstream communities.			
Landslide and flood risks on water structures	• Ensuring coordination among DSI, KGM and OGM by means of preparing and implementing an “Integrated Flood and Landslide Management (IFLM) Plan”. • Incorporate nature-based solutions to the highest extent possible in the IFLM Plan. • The IFLM Plan will be based on a field survey of risk points, in line with the risk maps. The surveys will be performed by the joint action of DSI, KGM and OGM. • Ensuring that final designs of DSI, KGM and OGM projects are prepared in accordance with the “Integrated Flood and Land-slide Management Plan”	Included in design, no additional cost.	DSI KGM OGM	
Water security	• Cooperate with OSKI for ensuring network leak detection, which may support review and re-consider reservoir design work. • Repairing leaks in order to minimize the need for additional resources. • Cooperate with OSKI for ensuring full coverage of sewerage networks so as to stop direct discharge of sewage into surface waters. • Ensuring upstream landslide risks are well assessed in order to protect the planned storage structures downstream. • Incorporate nature-based solutions to the highest extent possible		DSI	
Stakeholder engagement	• Stakeholder Engagement Plan to be prepared for each sub-project including a GM, through which stakeholders' concerns and complaints will be addressed.	Included in design, no additional cost.	DSI	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
E&S Impacts	• Prepare full ESIA Report (including ESMP) for each large dam and reservoir project (if not excluded through screening).	Included in design, no additional cost.	DSI	
Pre-Construction Stage				
Workforce and camp sites	• Prepare Labor Management Plan • Ensure adequate accommodation conditions in compliance with WB standards	Included in design, no additional cost.	DSI	
Storage structures and Dams: Environmental and Social Issues	• Prepare the following sub-project-specific management plans: - Biodiversity Management Plan - Waste Management Plan - Hazardous Materials Management Plan - Air Quality Management Plan - Noise Management Plan - Resettlement Plan - Water Quality Management Plan - Occupational Health and Safety Plan - Traffic Management Plan - Community Health and Safety Plan - Emergency Response and Preparedness Plan - Labor Management Plan - Stakeholder Engagement Plan • Incorporate nature-based solutions to the highest extent possible in the management plans. • Prohibit sand/aggregate mining from rivers/river banks.	Included in design, no additional cost.	DSI	
Flood Control and Sediment Control Works: Environmental and Social Issues	• Prepare the following sub-project-specific management plans: - Biodiversity Management Plan - Waste Management Plan - Occupational Health and Safety Plan - Traffic Management Plan - Labor Management Plan	Included in design, no additional cost.	DSI	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Health and Safety	• Prepare all procedures, and provide trainings required to carry out these processes in compliance with environmental, labor health and safety standards and regulations. • Emergency response procedures shall be applied in case of any spillage, and such incidents shall be reported to the site supervisor.	Included in design, no additional cost.	DSI	
Land acquisition	• Prepare and implement site-specific Resettlement Plans • Prepare and implement Livelihood Restoration Plan (LRP)	Included in design, no additional cost.	DSI	
Construction Stage				
Environmental and Social Issues • Dust from earthworks and exhaust gas from heavy duty vehicles • Noise • Impacts on aquatic habitat • Disturbance to riparian vegetation • Dam safety • Labor conditions	• Implement the following sub-project-specific management plans: - Biodiversity Management Plan - Waste Management Plan - Hazardous Materials Management Plan - Air Quality Management Plan - Noise Management Plan - Resettlement Plan - Water Quality Management Plan - Occupational Health and Safety Plan - Traffic Management Plan - Community Health and Safety Plan - Emergency Response and Preparedness Plan - Labor Management Plan - Stakeholder Engagement Plan • Prohibit sand/aggregate mining from rivers/river banks. • Ensure that reviews are made by the independent panel of experts (established at design stage) throughout construction of the dam. Provide a copy of the panel's report to the WB. • Ensure contracting of services of the panel of experts and provide administrative support for the panel's activities. • Arrange for periodic panel meetings and reviews, which continue through the investigation, design, construction, and initial filling and start-up phases of the dam. • Inform the WB in advance of the panel meetings. • After each meeting, ensure that the panel provides a written report of its conclusions and recommendations, signed by	Included in design, no additional cost.	DSI	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	each participating member; provide a copy of that report to the WB. • Refine and complete the operation and maintenance plan during implementation and has the final plan ready not less than six months prior to the initial reservoir filling • Refine and complete emergency preparedness plan during implementation and has the final plan completed not less than one year before start of reservoir initial filling			
Associated Facilities: Stone/Clay/Sand Pits: • Dust and Noise • Water Consumption • Disturbance to vegetation • Exhaust gas from heavy duty vehicles • Damage to ecological landscape	• Ensure an ESMP is included in the sub-contractor agreement • Ensure the facility is in full compliance with environmental and social regulations • Ensure a quarry restoration plan is in place	Included in design, no additional cost.	DSI	
Operation Stage				
• Noise from pumping stations • Increase in water consumption • Decrease in water availability for biodiversity. • Social conflict may arise due to un-serviced areas close to neighboring landscape to Bolaman • Few cases of harm to ecological services	Implement Management Plans as appropriate: - Biodiversity Management Plan - Waste Management Plan - Hazardous Materials Management Plan - Water Quality Management Plan - Occupational Health and Safety Plan - Community Health and Safety Plan - Emergency Response and Preparedness Plan - Dam Safety Procedures - Labor Management Plan - Stakeholder Engagement Plan	Included in design, no additional cost.	DSI	Tender and contract documents

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Storage structures: • Impacts on aquatic biodiversity • Impacts on riparian ecology • Impacts on river low rate and basin hydrology • Water rights of downstream communities • Hindered movement and migration of fish • Increased surface water pollution due to decreased flow-rate water downstream • Dam safety risks	Implement Management Plans as appropriate: - Biodiversity Management Plan - Waste Management Plan - Hazardous Materials Management Plan - Water Quality Management Plan - Occupational Health and Safety Plan - Community Health and Safety Plan - Emergency Response and Preparedness Plan - Dam Safety Procedures - Labor Management Plan - Stakeholder Engagement Plan In relation dam safety risks: • • Ensure panel of experts reviews the performance of the first filling • Carry out periodic safety inspections • Implement dam safety measures in line with operation and maintenance plan, and emergency preparedness plan	Included in design, no additional cost.	DSI	
Irrigation system's environmental risks	• Prevent and monitor soil quality against salinization during flood irrigations which may be implemented • Continued training to farmers who will shift to irrigated agriculture for the first time. • Prevent and monitor excessive use of fertilizers and pesticides that will eventually increase nitrate pollution of soil and groundwater sources.	No costs	TRGM	
Irrigation system's social risks	• Ensuring equal distribution of irrigation water between downstream and upstream users when open channel flood irrigation is used.	No costs	TRGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	• Extension services for the farmer who are new to irrigated agriculture such as: ○ Demonstration and introduction of innovative on-farm technologies, ○ capacity development of farmers and farmer organizations. ▪ introduction of water saving irrigation infrastructure (including laser land leveling), ▪ digital technologies and remote sensing, e.g. for irrigation scheduling; ▪ local water storage and recycling opportunities. ▪ support for high-value crop production ▪ advanced water management and resource monitoring. ▪ Marketing and initiation of value-added products			

Mitigation of Impacts and Risks from Sub-Component 1.2 (b) Resilient Mobility

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Rural roads rehabilitation by widening of the roads, resurfacing using hot mix bituminous asphaltic concrete (BSK), a waterproof coasting protective layer, runoff drainage and protective walls				
Design Stage				
Biodiversity and sensitive areas	• Avoid interference with critical habitats and sensitive/important areas (in natural habitats, protected areas, nationally and/or internationally recognized areas of biodiversity importance) including culturally sensitive areas during sub-project site selection.	Included in design, no additional cost.	KGM	
Landslide Risks	• Avoid planning of roads in high-risk areas, • If not, avoidable take necessary mitigation measures imposing design upgrades.	Included in design, no additional cost.	KGM	
Material supply from pits and quarries for construction of roads	• Planning for reusing construction waste and debris as fill material in road improvement works, which would significantly decrease the costs of waste management and diminish the need for quarries and associated costs of mitigation measures. • Coordinating with DSI and other IAs to establish the essential links for a circular economy and integrated natural resource management by recycling construction materials.	Included in design, no additional cost.	KGM DSI	
Stakeholder engagement	• Stakeholder Engagement Plan to be prepared for each sub-project including a GM, through which stakeholders' concerns and complaints will be addressed	Included in design, no additional cost.	KGM	
Pre-Construction Stage				
Environmental pollution risks OHS Labor Land acquisition Community HS	• Prepare the following sub-project-specific management plans: - Biodiversity Management Plan - Waste Management Plan - Hazardous Materials Management Plan - Air Quality Management Plan - Noise Management Plan - Resettlement Plan - Water Quality Management Plan - Occupational Health and Safety Plan - Traffic Management Plan - Community Health and Safety Plan - Emergency Response and Preparedness Plan - Dam Safety Procedures	Included in design, no additional cost.	KGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	- Labor Management Plan - Stakeholder Engagement Plan			
Construction Stage				
Environmental pollution risks OHS Labor Land acquisition Community HS	• Implement the sub-project-specific Management Plans: - Biodiversity Management Plan - Waste Management Plan - Hazardous Materials Management Plan - Air Quality Management Plan - Noise Management Plan - Resettlement Plan - Livelihood Restoration Plan - Water Quality Management Plan - Occupational Health and Safety Plan - Traffic Management Plan - Community Health and Safety Plan - Emergency Response and Preparedness Plan - Labor Management Plan - Stakeholder Engagement Plan	Included in the planning cost. No additional cost.	KGM	
Operation Stage				
Environmental pollution risks Community HS Biodiversity	• Implement the sub-project-specific Management Plans: - Biodiversity Management Plan - Waste Management Plan - Traffic Management Plan - Community Health and Safety Plan - Emergency Response and Preparedness Plan - Stakeholder Engagement Plan	Included in design, no additional cost.	KGM	
Associated Facilities: • Stone/Clay/Sand Pits and Quarries: • Disturbance to vegetation • Continued damage to ecological	• Ensure an ESMP is included in the sub-contractor agreement • Ensure the facility is in full compliance with environmental regulations • Ensure a quarry restoration plan is in place	Included in design, no additional cost.	KGM	

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
landscape if not restored.				

Table 5-4. Monitoring Plan

Monitoring of E&S Mitigation Measures for Sub-Component 1.1 (a) Forest landscapes and livelihoods upstream

Impact/Issue	Monitoring Parameters	Monitoring Method	Frequency	Period
Landslide control, pastureland management, ecosystem reservoirs, service roads, equipment procurement, warehouse construction, surrounding walls, PV, solar water heating, recreational facilities, fruit trees, greenhouses, livestock breeding, bee keeping, bakeries				
Pre-Construction Stage				
Environmental Issues	• Environmental and Social Management Plan • Biodiversity Management Plan and Site Procedures • Waste Management Plan • Pesticide Management Plan • Occupational Health and Safety Plan • Community Health and Safety Plan • Pesticide Management Plan • Integrated Landslide and Flood Control Plan	Desk-top review of ESMP and each management plan	Once-off	
Social Issues	• Environmental and Social Management Plan • Labor Management Plan • Community Health and Safety Plan • Stakeholder Engagement Plan • Livelihoods Restoration Plan	Desk-top review of ESMP and each management plan	Once-off	
Construction Stage				
Environmental Issues	Implementation of: • Environmental and Social Management Plan • Biodiversity Management Plan and Site Procedures • Waste Management Plan • Pesticide Management Plan • Occupational Health and Safety Plan • Community Health and Safety Plan • Pesticide Management Plan • Integrated Landslide and Flood Control Plan	On-site observations and review of records as per monitoring plan of each management plan	Quarterly	

Impact/Issue	Monitoring Parameters	Monitoring Method	Frequency	Period

Community workers in erosion, landslide, and flood control works.	• Implementation of the
	  ○ Labor Management Plan
	  ○ Community Health and Safety Plan
	  ○ Stakeholder Engagement Plan
	  ○ Livelihoods Restoration Plan
	• Sanitary conditions for all labor force, particularly for the female workers.
	• Road safety for transportation of workers to-and-from project sites.
	• Security measures for workers (i.e. wildlife encounters)
	• Lists of workforce (with ages) with particular concern on child labor
	• Measures against sexual abuse and harassment
		Site inspections:
		
		visual observations and checking of safety and security records and lists of workforce and workers grievance records
			Monthly	

Increased penetration into forests as a result of increased quality of access roads	• Security measures against uncontrolled trespassers and poachers into the forests. • Control measures against illegal opening of new access routes. • Control measures against fire risks imposed by increased fire risks from increased access into the forests. • Control measures for protecting wildlife from increased human activities within forest areas.	Site inspections: visual observations of measures taken.	Quarterly	Tender and contract documents
Operation Stage				
Community risks of falling and drowning in the ecosystem reservoirs	Check measures: • Security fencing • Adequate warning signage to warn public of any dangers. • Learning/Training campaigns to sensitize community residents about the risks of drowning in the reservoirs.	Visual observations	Quarterly	
Occupation of pasture lands by increased livestock grazers	• Check control measures against illegal occupation • Check if any illegal occupation has taken place.	Visual observations	Quarterly	
Landslide risks triggered by road extension works	• Regular site investigations for slope stability at road sides.	Visual observations	Daily	

Monitoring of E&S Mitigation Measures for Sub-Component 1.1 (b): Sustainable and climate-smart agricultural practices and value chains

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
Greenhouses, hazelnut groves, fruit trees, mushroom, pocket terracing, good agriculture, livestock breeding, shepherd houses, barns, geese, beekeeping, pasture organization, etc.				
Pre-Construction				
Environmental Issues	**Check availability and contents of:** • Environmental and Social Management Plan • Biodiversity Management Plan and Site Procedures • Occupational Health and Safety Plan • Pesticide Management Plan • Waste Management Plan • Pesticide Management Plan • Integrated Landslide and Flood Control Plan	Desk-top review of ESMP and each management plan	Once-off	
Social Issues	**Check availability and contents of:** • Labor Management Plan • Community Health and Safety Plan • Stakeholder Engagement Plan • Livelihoods Restoration Plan	Desk-top review of ESMP and each management plan	Once-off	
Community workers health and safety risks in terracing works due to mobilizing the farmers for small construction works.	• Workers OHS Training Plans • Worker contracts inclusive of adequate labor conditions • Labor Management Plans	Document review Visual observations of OHS measures	Once-off	
Construction				
Community health and safety risks in terracing works	• Workers OHS Training Plan • Training records, participation lists • Worker contracts inclusive of adequate labor and employment	Document review	Monthly	

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
due to mobilizing the farmers for small construction works.	conditions • Labor Management Plans	Visual observations of OHS measures		
Operation				
Risk of landslides	• Rainwater drainage systems installed on terraces.	Visual observations	Quarterly (Monthly during wet seasons)	Tender and contract documents
Occupation of pasturelands by increased livestock grazers	• Existence of measures against illegal occupation • Existence of any illegal occupation • Livelihood Restoration Plan • Resettlement Plan	Visual observations	Quarterly	
Livelihoods of hazelnut farmers affected for the 5-years period of re-growth	• Check farmers are compensated by means of grants for their economic loss until they can start harvest again.	Compensation records Bank transfer documents Consultations with affected farmers	Quarterly	

Monitoring of E&S Mitigation Measures for Sub-Component 1.2 (a): Resilient infrastructure for water security

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
Dams and small-scale multipurpose reservoirs, , irrigation works, flood and sedimentation control				
Pre-Construction Stage				
Environmental and Social (Generic)	• Biodiversity Management Plan • Waste Management Plan • Hazardous Materials Management Plan • Air Quality Management Plan • Noise Management Plan • Resettlement Plan • Livelihoods Restoration Plan • Water Quality Management Plan • Occupational Health and Safety Plan • Traffic Management Plan • Community Health and Safety Plan • Emergency Response and Preparedness Plan • Dam Safety Plan and Procedures • Stakeholder Engagement Plan	Review of sub-project specific MPs and procedures listed.	Once off	
Workforce and Camps	• Labor Management Plans for each site • Accommodation conditions in compliance with WB standards	Review of sub-project specific Labour Management Plans. Visual observations for checking accommodation conditions for compliance with WB standards	Quarterly Quarterly	
Workers OHS	• OHS plan and procedures • OHS Training Plan • Records of trainings (participation lists, curriculum, etc.)	Review of plans and procedures against national and WB standards.	Once-off	

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
Community Health and Safety	• Dam Safety Report • Dam Safety Commission records	Review of Dam Safety Report. Review of Dam Safety Commission records/reports.	Once-off	
Land acquisition	• Resettlement Plans • LRP • Grants Programme	Review of sub-project specific resettlement plans. Review of sub-project specific LRPs. Review of Grants Programme progress reports	Once-off	
Associated Facilities: Stone/Clay/Sand Pits: • Dust and Noise • Water Consumption • Disturbance to vegetation • Exhaust gas from heavy duty vehicles • Damage to ecological landscape	• ESMPs to be included in the sub-contractor agreements • Grievance records of Provincial Directorate of Environment and Urbanization for nuisance from dust and noise generation at the quarries. • Quarry restoration plans to be in place.	Review of contract agreements and ESMPs for each quarry used for sub-projects. Visual observation of site practices and control measures for full compliance with environmental and OHS regulations. Review of monitoring /grievance records (dust, noise, gaseous emissions) Review of restoration plan for each quarry used for sub-projects.	Once-off at the time of contract agreement.	

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
Construction Stage				
• Noise from pumping stations • Loss of biodiversity/impacts on habitats • Increase in water consumption • Decrease in water availability for biodiversity. • Damage on ecological services	• Relevant parameters in the site-specific Biodiversity Management Plans • Waste storage, collection and disposal • Wastewater collection and storage, package treatment • Accidents and near-misses • Dam Safety • Employment and labour conditions • Community health and safety	Noise surveys Biodiversity surveys Service contract agreement with OSKI for waste collection and disposal and wastewater collection from cesspits. Visual observations for appropriate storage/disposal of wastes. Review of records for waste and wastewater. Community consultations Consultations with workers. OHS records of accidents and near-misses. On-site inspection of dam safety procedures. Employment records (age, terms and conditions of working, etc.) Community grievance records	Quarterly (noise, biodiversity, waste and wastewater) Monthly (community consultations and grievance records) Monthly (accidents and near-misses) Monthly/Quarterly dam safety panel inspections (to be defined by the panel of experts) Quarterly (employment records)	Tender and contract documents

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
Operation Stage				
Intake structures and connections • Noise from pumping stations • Increase in water consumption • Decrease in water availability for biodiversity. • Social conflict may arise due to un-serviced areas close to neighboring landscape to Bolaman • Few cases of harm to ecological services	• Relevant parameters in the site-specific Biodiversity Management Plans • Waste storage, collection and disposal • Wastewater collection and storage, package treatment • OHS accidents and near-misses • Dam Safety • Community health and safety	Biodiversity surveys Service contract with OSKI for waste collection and disposal and wastewater collection from cesspits. Visual observations for appropriate storage/disposal of wastes. Review of records for waste and wastewater. Community consultations Consultations with workers. OHS records of accidents and near-misses. On-site inspection of dam safety procedures. Employment records (age, terms and conditions of working, etc.) Community grievance records	Semi-annual (biodiversity: months to be indicated by biodiversity expert) Semi-annual (waste storage and disposal; wastewater discharge) Annual (community consultations; workers; grievances) Annual (accidents and near-misses) and at the time of incidence. Annual (employment records)	Tender and contract documents

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
Water storage structures: • Impacts on aquatic biodiversity • Impacts on riparian ecology • Impacts on river low rate and basin hydrology • Water rights of downstream communities • Hindered movement and migration of fish • Increased surface water pollution due to decreased flow-rate water downstream • Dam safety risks	• Relevant parameters in the site-specific Biodiversity Management Plans • Migratory fish in the rivers • Environmental flow • Service contract with OSKI for waste collection and disposal • Waste storage areas on the site • Wastewater collection and storage, package treatment • OHS accidents and near-misses • Dam Safety • Community health and safety	• Biodiversity surveys • Check adequate functioning of fish passages • Real-time monitoring of river flow and environmental flow rate records (flow rate records of DSI) • Service contract with OSKI for waste collection and disposal and wastewater collection from cesspits. • Visual observations for appropriate storage/disposal of wastes. • Review of records for waste and wastewater. • Community consultations • Consultations with workers. • OHS records of accidents and near-misses. • On-site inspection of dam safety procedures. • Employment records (age, terms and conditions of working, etc.) • Community grievance records	Semi-annual (terrestrial biodiversity and aquatic: months to be indicated by biodiversity expert) Continuous (real time monitoring of environmental flow); quarterly reporting. Semi-annual (waste storage and disposal; wastewater discharge) Annual (community consultations; workers; grievances) Annual (accidents and near-misses) and at the time of incidence. Annual (employment records	

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
Irrigation system environmental risks	• Soil quality • Groundwater quality at drinking water supply wells	On-site sampling and lab analyses for soil quality for salinization and nitrates Sampling and lab analyses of groundwater for drinking water quality	Semi-annual Semi-annual	
Irrigation system social risks	• Complaints of farmers	Review of grievance records Review of records of farmer consultations	Semi-annual	

Monitoring of E&S Mitigation Measures for Sub-Component 1.2 (b): Resilient Mobility

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
Rural roads rehabilitation by widening of the roads, resurfacing using hot mix bituminous asphaltic concrete (BSK), a waterproof coasting protective layer, runoff drainage and protective walls;				
Pre-Construction Stage				
Environmental pollution risks OHS Labor Land acquisition Community HS	• Biodiversity Management Plan • Waste Management Plan • Hazardous Materials Management Plan • Air Quality Management Plan • Noise Management Plan • Resettlement Plan • Livelihoods Restoration Plan • Water Quality Management Plan • Occupational Health and Safety Plan • Traffic Management Plan • Community Health and Safety Plan • Emergency Response and Preparedness Plan • Dam Safety Plan and Procedures • Labor Management Plan • Stakeholder Engagement Plan	Review of sub-project specific MPs and procedures listed. Consultations with affected people with livelihoods in state-owned lands (i.e. road sides, drainage routes, retention walls, etc. acquired for road rehabilitation/construction)	Once-off (management plans) Once-off consultations at the time of land acquisition	
Construction Stage				
Environmental pollution risks OHS Labor Community HS	• Measures specified in the: o Biodiversity Management Plan o Waste Management Plan o Hazardous Materials Management Plan o Air Quality Management Plan o Noise Management Plan o Resettlement Plan o Livelihoods Restoration Plan o Water Quality Management Plan o Occupational Health and Safety Plan o Traffic Management Plan o Community Health and Safety Plan o Emergency Response and Preparedness Plan o Dam Safety Plan and Procedures	Review of implementation of sub-project specific MPs and procedures listed. List of affected people during land acquisition.	Quarterly (for management plans)	

Impact/Issue	Monitoring Parameter	Monitoring Method	Frequency	Period
	○ Labor Management Plan ○ Stakeholder Engagement Plan • Prioritization of affected people in grants programme			
Operation Stage				
Biodiversity Environmental risks Community HS	• Relevant parameters in the site-specific Biodiversity Management Plans • Mitigation measures against landslides (slope stabilization, drainage, etc.) • Waste and wastewater collection and disposal during maintenance works • Nuisance on communities (dust and exhaust gas, noise and vibration, blockage of access roads, etc.) • Wildlife passages	Bio-diversity surveys Visual observations of landslides Visual observations of waste/wastewater disposal at maintenance Consultation with communities Visual observations of wildlife passages, biodiversity surveys Consultation with affected people (of land acquisition) for priority in grants programme.	Semi-annual (as indicated by the biodiversity expert) Monthly (landscape); daily at times of heavy rainfall Maintenance time (waste and wastewater) Annual (consultations with local people for any nuisance from roads) Monthly (wildlife passages) Annual (for sustained of livelihoods of affected people)	

6 IMPLEMENTATION ARRANGEMENTS for the ESMF

This chapter describes the institutional arrangements for the ESMF aspects of the full project management and implementation. Please refer to Figure 1.1 for the overall layout of organization of the project units.

6.1 Project Coordination Unit (PCU)

PCU will be the main coordinating body and will be staffed to carry the technical capacity that will technically support other management units of the project. PCU will include at least two environmental experts, two social experts, one OHS expert, one biodiversity expert, and one archaeologist, if needed (in case of chance finds) with relevant qualifications and skills.

The ESF responsibilities of the PCU will be as follows:

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

6.2 Project Implementation Units (PIUs)

Central level PIUs are project implementation units at each IA at central level. In coordination with their regional and provincial Directorates, agency-specific PIUs will be responsible for the execution of project activities under their respective sub-components.

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

To build capacity, PCU will organize trainings to familiarize the PIUs with the WB's ESSs and the ESMF, including preparation and implementation of sub-project specific E&S documents, RF, ESCP, SEF, LMP and sub-project-specific E&S documents.

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

The ESMF responsibilities of each Central level PIUs will be as follows:

- Undertake the screening process of the sub-projects regarding E&S risk categorization according to the World Bank's ESF requirements.
- Prepare ESA documents with the supervision and technical support of PCU and present to PCU for final approval.
- Report to the PCU as per implementation of ESIAs/ESMPs, SEPs, LMPs, RPs and GMs quarterly during construction stage and semi-annually during the implementation/operation stage.
- Report to PCU on records of chance finds, OHS accidents, received grievances, consultations.
- Perform monthly supervision of the implementation of ESMF, RF, ESCP, site-specific E&S documents and any other ESSs requirements by their respective Regional/Provincial Directorates (RDs/PDs) and Field Offices (FOs), and document performance, recommendations and any further actions required as part of overall project supervision reporting to the WB.
- Monitor and audit environmental and social issues at the sites (including OHS issues) through data collected from the site visits.

6.3 Regional/Provincial Directorates (RDs/PDs)

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

Regional/Provincial Directorates of the IAs

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

6.4 Assessment of ESMF Implementation Capacity of Partner Institutions

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

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

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

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

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

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

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

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

As government authorities, no one under the legal age (18 years) is permitted to work within the organization, thus no child labor related issues are expected. Cases including unregistered/uninsured employment of refugees, unequal employment opportunities for women etc. that may be relevant to civil works of contractors may encounter, will not be an issue in terms of incompliance with ESS2 for the IAs.

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

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

6.5 Capacity Building

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

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

The training will be provided to the project staff, construction contractors, and other staff engaged in the Project. Training will cover all staff levels, ranging from the management and supervisory to the skilled and unskilled categories. The scope of the training will cover general environmental and social awareness and the requirements of the relevant ESSs under the ESCP, ESMF, ESIA (where relevant) and the ESMP, with special emphasis on sensitizing the project staff to the environmental, social and gender aspects of the region. Table 6-1 provides a summary of various aspects of the environmental and social safeguards training to be conducted under this project. The PIUs may revise the plan during the project implementation as required and subject to the PCU approval.

Table 6-1. Capacity Building Scope

Target Audience	Contents	Responsibility	Schedule
OGM DSI KGM TRGM	General environmental and socioeconomic awareness Environmental and social sensitivity of the project area E&S screening Key findings of ESIA (as relevant) Mitigation measures ESMP Social and cultural values of sub-project areas Grievance Mechanism Gender equality trainings Conflict management Research methodologies	PCU	Prior to the start of the Project activities.
RIUs and PIUs PSC	General environmental and socioeconomic awareness	PCU	Prior to the start of the field activities.

Target Audience	Contents	Responsibility	Schedule
Contractors	Environmental and social sensitivity of the project area E&S screening Mitigation measures Community issues Awareness of transmittable diseases, risk of Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH) Social and cultural values Grievance Mechanism Gender equality trainings Conflict management		To be repeated as needed.
RIUs and PIUs PSC Contractors	ESMP Associated Management Plans (i.e. Waste Management Plan, Labor Management Plan, Traffic Management Plan, etc. as relevant). OHS Management Plan SEP LMP Grievance Mechanism Cultural values and social sensitivity Chance find procedure Gender equality trainings Conflict management	PCU	Prior to the start of the construction activities. To be repeated as needed.
Drivers	Road safety Defensive driving Cultural values and social sensitivity Chance find procedure Gender equality trainings Conflict management	PCU Contractors	Before and during the construction activities. To be repeated as needed.
Forest Villagers	OHS Management Plan Grievance Mechanism Chance finds procedure Gender equality trainings Conflict management	PCU/PIUs/RDs/PDs	Prior to start of sub-project activities To be repeated as needed
PIUs	ESMP for operation stage OHS Management Plan LMP Gender equality trainings Conflict management	PCU	Prior to the Start of the Project Operation and when required

6.6 Budget of Implementing ESMF

An estimate for implementation of the ESMF is presented in Table 6-2 below.

Table 6-2. ESMF Implementation Budget

Description	Cost (USD)
ESF Team (15 Experts, per 18 months)	810,000
ESF Instruments to be outsourced for Bolaman Basin (ESIA Documents, additional surveys, GIS applications, field surveys, etc.)	500,000
Management Plans for Bolaman Basin	100,000
ESF Instruments to be outsourced for Çekerek ESIA Documents, additional surveys, GIS applications, field surveys, etc.)	250,000
Management Plans for Çekerek Basin	100,000
Total	1,760,000

Mitigation measures are included in the sub-project designs;; hence no additional costs are envisaged. Project-specific Management Plans and ESF instruments will be prepared by IAs with the support of ESF Team in each PCU.

7 E&S MANAGEMENT PROCEDURES

7.1 E&S Screening of Sub-projects

Environmental and social management starts with the Environmental and Social (E&S) Screening of proposed sub-projects. The main purpose of the environmental and social screening is to identify and rate environmental and social risks at the early stage of sub-project preparation and design. E&S Screening will determine which sub-project specific ESF instruments will have to be prepared. The proposed sub-projects will be screened by the respective PIUs, with the help of professional E&S consultants mobilized by the PCU. The ESF Team within the PCU will supervise the PIUs in their screening process and will finally review and compile the results of screening before submission to WB for no-objection. The screening report cleared by the WB then will be endorsed to PIUs for implementation.

The development of sub-project specific ESF instruments shall be initiated and implemented by the PIUs under the guidance of the PCU once the exact locations and advanced draft designs and feasibility studies are designated for each sub-project. Guidance for monitoring process is described below. The monitoring of the sub-projects will be performed by the PIUs in consultation and support of the PCU. The regular ESMP monitoring reports for the sub-projects will be presented and to the WB by the PCU.

During the screening process, ineligibility assessment will also be covered prior to the environmental and social categorization of sub-projects in line with the ESMF. Sub-projects that may have significant impacts on biodiversity values including protected species or protected areas; impacts on known cultural heritage areas, as well as “High Risk” sub-projects are considered as ineligible and will be screened out from the project scope.

The environmental and social screening would involve: (i) reconnaissance of sub-project area and its surroundings; (ii) identification of major sub-project activities; and (iii) preliminary assessment of the impacts of these activities on the ecological, physico-chemical and socio-economic environment of the sub-project surrounding areas and considerations that need to be further investigated through ESMP or ESIA as appropriate.

Please see Annex-1 for Screening Check List to be applied for all sub-projects.

Each PIU will apply the environmental and social screening for the sub-projects under their respective sub-components. The screening will be submitted by PIUs with proposed screening categories for the sub-projects to the PCU for approval, and finally to the World Bank for clearance. The information submitted to the WB for this purpose will include the proposed screening category including ESF requirements and the key environmental and social issues to be analyzed together with information substantiating the category selection.

In cases where several separate investments (activities) are connected and constitute components of a single a sub-project, all activities will be evaluated as a single sub-project. The ESIA/ESMP prepared for such sub-project should combine all the activities to be implemented under the sub-project. In cases where components are technically independent of each other the ESIAs/ESMPs of the activities may be prepared separately and works may commence at separate times.

In terms of Turkish EIA context, depending on the capacity of grey infrastructural objects, the grey investments will most likely be subject to Annex II of the EIA Regulation. Regardless of whether an EIA is required or not as per national EIA legislation, for all sub-projects categorized with “substantial risk”, a detailed ESIA Report will be required in accordance with ESF ESS requirements, and presented to WB for approval. All sub-projects, regardless of their EIA status,

will be required to meet relevant ESSs, including ESS 10 (public disclosure, grievance mechanism, etc.), in addition to compliance with national legislation.

Based on results of additional surveys and assessments, PIUs, in coordination with RIUs, will confirm and submit the proposed screening categories for the sub-projects to the PCU for approval and transmitting to WB for clearance (No-Objection).

Table 7.1 provides an estimate for risk categorization based on currently available information about the selected sub-projects. These categories will be updated after screening of the sub-projects, when more details about the sub-projects and their sites become available. It should be noted that all sub-projects will be required to meet relevant ESSs, including ESS10, in addition to the national law.

7.2 No-Regret Projects

Due to the pressing problems of flooding and landslides, more prolonged drought events, the lack of water storage and irrigation infrastructure, and poor road conditions affecting local mobility and market access, infrastructure solutions are urgently needed to address these challenges in the target basins. Such investments were pre-identified during project preparation through the strategic plans of the IAs and validated through the participatory SESAs developed for each basin. A selected subset of these investments will be initiated during early project implementation, before the ILMPs are in place, through the development of sub-project-specific Feasibility and E&S studies appraised by the Bank, as concrete no-regret measures defined as first steps in a process that ensures sustainable development and future resilience. Investment prioritization criteria of these early stage investments will be specified in the POM and will be subject to site-specific E&S assessment and all criteria and requirements set out in the ESMF. The selection criteria will include, inter alia, those to identify E&S risks, importance of investment to improve the critical resilience and mitigate disaster risks. These investments will be agreed with stakeholders and approved by the Bank.

Table 7-1. Preliminary E&S Screening

Project Components	E&S Risk Category	Main Impact Issue	ESA required with respect to ESMF
Component 1: Investments in Resilient Landscape Integration in targeted areas			
Sub-Component 1.1. Green infrastructure and sustainable livelihoods			
1.1.a Forest landscapes and livelihoods upstream			
(i) Small-scale erosion, landslide, and flood control upstream	Moderate	Minor construction works OHS risks of forest workers with no skills on in construction works.	• ESMPs • On-site risk assessments of high-risk spots • OHS Audits • SEPs • LM Plans
(ii) Forest rehabilitation and sustainable management	Moderate	Increased risk of landslides. CHS risks from ecosystem ponds.	• ESMPs • SEPs • LM Plans
(iii) Forest pasture rehabilitation and sustainable management	Moderate	Indirect impacts from over population of grazing livestock. OHS risks on forest villagers	• ESMPs • SEPs • OHS audits • LM Plans
(iv) Income generation and livelihood diversification for forest villages	Moderate	Possible nitrate contamination from fertilizer application.	• ESMPs • SEPs • LM Plans
1.1.b Sustainable and climate-smart agriculture & value chains			

Project Components	E&S Risk Category	Main Impact Issue	ESA required with respect to ESMF
(i) Sustainable and climate-smart agricultural practices	Moderate to Substantial	Loss of income during initial years of restoration of hazelnut groves and establishment of new ones.	• ESMPs • SEPs • LRPs • LM Plans • OHS audits
(ii) Pasture rehabilitation and sustainable management outside forest lands	Moderate to Substantial	Pesticide management; habitat disturbance. OHS risks on farmers/villagers.	
(iii) Agricultural diversification for non-forest villages	Low	N/A	• ESMPs • SEPs • LRPs
(iv) Sustainable agricultural value chains	Low to Moderate	Indirect impacts from over population of grazing livestock. Temporary loss of livelihoods for restoration of hazelnut plantations.	
Sub-Component 1.2. Resilient gray infrastructure			
1.2.a Resilient infrastructure for water security			
(i) Dams and multipurpose reservoirs	Substantial	Impacts during construction and operation, including: Dam safety Occupational HS Community HS Land acquisition Use of associated quarries	• ESIAs • ESMPs • SEPs • RPs • LM Plans • Dam Safety Review and
(ii) Irrigation schemes			

Project Components	E&S Risk Category	Main Impact Issue	ESA required with respect to ESMF
(iii) Flood and sedimentation control structures		Habitat disturbance Basin hydrology Water rights of downstream communities Hindered movement migrating fish Increased water pollution downstream Loss of ecological services Associated quarries	related detailed plans[26] • LRPs • Chance Find Procedure
Sub-Component 1.2.b. Resilient mobility			
(i) Resilient rural road rehabilitation	Substantial	Disturbance of habitat Increased landslides and erosion Land acquisition (camp sites) Associated quarries	• ESIAs • SEPs • LM Plans • LRPs • RPs

[26] Preparation and implementation of detailed plans: a plan for construction supervision and quality assurance, a plan for instrumentation, an operation and maintenance plan, and an emergency preparedness plan.

7.3 Risk Categorization and Preparation of ESF Instruments

The type and content of the sub-project specific environmental and social assessment which would meet the requirements of ESSs will be defined by the risk rating and specific issues associated with sub-projects, as discussed above. Risk rating tools will be used as appropriate to assign the risk category.

In accordance with the screening procedure, sub-projects with "***High***" risk category will be screened out from the project scope. Please see Annex 1 for screening criteria and Annex 2 for the range of risk categories.

Sub-projects (especially those which relate to construction/rehabilitation of dams, reservoirs, and other water retaining structures) found to be "*Substantial*" risk as a result of the screening as per criteria (see Annex 1 for screening criteria and Annex 2 for the range of risk categories), an **ESIA Study will be prepared** in line with the requirements of ESS1 and taking into account all the relevant ESS requirements. An indicative outline of the ESIA is given in Annex 3A. Based on the findings of site-specific ESIA, sub-projects qualified with "***High***" risk will not be eligible for the project financing and will be excluded from the project scope.

Environmental and social risk classification considers relevant potential risks and impacts, such as:

- the type, location, sensitivity and scale of the Project including the physical considerations of the Project; type of infrastructure; waste management and disposal, etc.

- the nature and magnitude of the potential E&S risks and impacts, including impacts on greenfield sites; impacts on brownfield sites including (e.g., rehabilitation, maintenance or upgrading activities); the nature of the potential risks and impacts (e.g. whether they are irreversible, unprecedented or complex); land requirement necessitating land acquisition (including legacy of past land acquisitions) and existing land disputes; presence of vulnerable groups/people; and possible mitigation measures considering the mitigation hierarchy;

- the capacity and commitment of the IA to manage such risks and impacts in a manner consistent with the WB ESSs, including the country's policy, legal and institutional framework; laws, regulations, rules and procedures applicable to the Project sector; the technical and institutional capacity of the IA; track record of past Project implementation; and the financial and human resources available for management of the Project; and

- other areas of risk that may be relevant to the delivery of E&S mitigation measures and outcomes, depending on the specific Project and the context in which it is being developed, including the nature of the mitigation and technology being proposed, considerations relating to domestic and/or regional stability, conflict or security.

As per the procedures provided in the Table 7-2, for ***Substantial Risk Category*** sub-projects, detailed ESIA will be required. These should include site-specific information (e.g. environmentally sensitive areas, or need to better define and understand potential issues, brief description of impacts specifying well defined mitigating measures and adopting accepted operating practices and monitoring). The ESIA will also include site-specific information including but not limited to baseline information, the methodology for impact assessment, analysis of alternatives, and analysis of respective environmental and social impacts in accordance with the methodology, mitigation and monitoring plans and roles. A template of a full scale ESIA is given in Annex 3 and an OHS Plan is appended in Annex 5 to support the ESIA and ESMP documents. Preparation of an ESIA will be the responsibility of the central PIUs under supervision and technical support of PCU; the implementation of ESMPs is the

responsibility of PIUs and RDs/PDs, as pertinent to each sub-project, under direct support and supervision of the PCU.

Table 7-2. Procedures for Substantial Risk Sub-Projects

Sub-Project Phase	Procedure	Responsible Party
Pre-Feasibility	ES Screening	PIUs (with technical support from PCU)
	Consultations with key stakeholders (as per SEP)	Regional Directorates
Feasibility Study/Design	Preparation of ESIAs	PCU and PIUs
	Public consultations (as per SEP)	PIUs
	Prepare RP (if relevant)	PCU and PIUs
	Implement RP (if relevant)	PIUs and RDs/PDs (with direct support from PCU)
Detailed Design & Tendering	Final designs inclusive of mitigation measures (from ESMP)	PCU and PIUs
	Bidding Documents inclusive of ESMP and LMP and Chance Find Procedure	PCU and PIUs
	Procurement and contracting	PCU and PIUs
	Implement RP (if relevant)	PIUs (with direct support from PCU)
Construction Works	Implement ESMP and LMP	PIUs (with direct support from PCU)
	Monitor ESMP and LMP	PIUs (with direct support from PCU)
	Update ESIA (and ESMP) as required	PCU and PIUs
Post-Construction	Environmental Audit Planning	PCU and PIUs
	Environmental Audit Implementation	PIUs (with direct support from PCU)
Operation / Implementation	Implement ESMP and LMP	PIUs (with direct support from PCU)
	Implement GM	All PCU and PIUs
	Monitor ESMP and LMP	PIUs (with direct support from PCU)

For ***Moderate Risk Category*** sub-projects, site-specific ESMPs will be required to ensure enhancements such as the “green projects” are implemented. The ESMPs should clearly lay out:

a) project description
b) legislative framework
c) Relevant environmental and social baseline

d) Identification of potential environmental and social impacts
e) the measures to be taken during both construction and operation phases of a sub-project to eliminate or offset adverse environmental and social impacts, or reduce them to acceptable levels;
f) the actions needed to implement these measures; and
g) a monitoring plan to assess the effectiveness of the mitigation measures employed; and
h) respective responsibilities for implementation, monitoring and reporting.

The indicative outline for an ESMP is given in Annex 3B.

The PCU will verify the results of sub-project ESIAs and ESMPs and will communicate to WB for approval.

Preparation of the ESMPs will be the responsibility of the PIUs under supervision and technical support of the PCU. The implementation of the ESMPs is the responsibility of PIUs and RDs/PDs as pertinent to each sub-project under direct support and supervision of the PCU.

Table 7-3. Procedures for Moderate Risk Sub-Projects

Sub-Project Phase	Procedure	Responsible Party
Project Identification/Pre-Feasibility	Environmental and Social Screening of sub-projects	PIUs (with technical support from PCU)
	Consultations with key stakeholders (as per SEP)	PIUs (with direct support from PCU)
Feasibility Study/Design	Prepare ESMP	PIUs
	Public consultations (as per SEP)	PIUs (with direct support from PCU)
	Implement RF and if required, prepare RP	PIUs (with direct support from PCU)
Detailed Design & Tendering	Ensure mitigation measures (from ESMP) included in design	PCU and PIUs
	Ensure ESMP and LMP aspects included in Bidding Documents	PCU and PIUs
	If required, prepare and implement Chance Find Procedure (CFP) for Cultural Heritage	PIUs (with direct support from PCU)
Construction Works	Implement and monitor ESMP, LMP	PIUs (with direct support from PCU)
	Update ESMP as required	PIUs
Post-Construction	Environmental Audit Planning	PCU and PIUs
	Environmental Audit Implementation	PIUs (with direct support from PCU)
Operation / Implementation	Implement ESMP	PIUs (with direct support from PCU)
	Implement GM	PIUs (with direct support from PCU)
	Monitor ESMP	PIUs (with direct support from PCU)

Low Risk Sub-Projects

A project is classified as Low Risk if its potential adverse risks to and impacts on human populations and/or the environment are likely to be minimal or negligible. Therefore, Low Risk Category sub-projects, with few or no adverse risks and impacts and issues, will not require further E&S assessment following the initial screening according to the World Bank's ESF requirements.

Completing a satisfactory ESIA/ESMP is the responsibility of the concerned PIU. They will fund the cost of the ESIA/ESMP from the own resources each IA as pertinent to the sub-project. The cost estimates of the site specific ESIAs/ESMPs will provide specifics about the responsible agency and relevant costs for each mitigation/monitoring activity.

The PCU will perform an overall quality assurance function that the documents prepared meet the World Bank requirements. In reviewing an ESIA or ESMP, PCU will also confirm that it is clear, feasible and appropriate and in accordance with the requirements of ESSs relevant for the project. Additionally, the PCU will monitor the implementation of the ESMPs and ensure that regular reporting tools are in place.

7.4 Public Consultation and Information Disclosure

As it is described in the Stakeholder Engagement Framework (SEF) document prepared for the overall Project, stakeholder engagement will take place within a systematic plan. Hence all IAs will prepare Stakeholder Engagement Plans (SEPs) for each project category under their field of interest. Each SEP will be formulated to ensure that project-affected people and other stakeholders are provided relevant, timely and accessible information so that they have an opportunity to express their views and concerns about the project category and corresponding range of impacts.

In addition, for projects that require resettlement and environmental and social impact assessment, SEPs will be prepared in accordance with the SEF on sub-project basis. SEPs will aim to regulate the communication of IAs and contactors with project-affected people and other stakeholders.

SEPs proportionate to the nature and scale of the environmental and social impacts of the proposed sub-projects will be prepared as an integral part of Environmental and Social Assessment (ESA). The SEF provides (i) background information on both national and international regulation and requirements to be considered during execution of stakeholder engagement activities and preparation of the SEPs, (ii) preliminary stakeholder analysis and a stakeholder program, (iii) structure of the grievance mechanism to be established for the Project. The sub-project specific SEPs will be in line with but not limited to the initial assessments, overall structure and guidance presented in the SEF.

All sub-project specific ESF instruments (i.e. ESIAs, ESMPs, SEPs, LMPs and RPs, etc.) will be disclosed to the public as defined in their SEP parts.

The timing and methods of engagement with stakeholders throughout the life cycle of projects will be described in sub-project specific SEPs. Public consultation activities (including public consultation meetings) will be carried out as defined in each SEP to be prepared. All consultation activities will consider additional measures to be taken in line with prevailing governmental restrictions under Covid-19 pandemic conditions. Records of meetings and consultations with stakeholders will be included in the draft and final ESF instruments.

Preparation and implementation of sub-project specific SEP are the responsibility of all PIUs and PCUs, including central and regional levels. Central PCU will perform an overall quality

assurance function that the documents prepared meet the WB requirements. In reviewing a SEP, central PCU will also confirm that it is clear, feasible and appropriate.

Public disclosure of information is also described in the SEF and will also be described in SEPs for sub-projects along with engagement activities. The draft site specific ESA documents will be disclosed on the project website. All of the social and environmental progress of the project will be published on the project website under the name of the Quarterly Environmental and Social Progress Reports.

Prior to sub-project approval (by the World Bank), OGM will submit English versions of the final ESIAs, ESMPs, SEPs, LMPs and RPs to the World Bank for disclosing on its external website.

7.5 World Bank Clearance

The WB will provide No-Objections to the conclusion of project categorization and list of required ESF instruments. The WB will also review and provide clearance for the ESF instruments prepared for Substantial risk sub-projects and selected Moderate risk sub-projects. During the implementation of a sub-project, the WB can mutually agree with PCU that PIUs conduct prior review of the environmental and social assessment documents of “Low Risk” and “Moderate Risk” sub-projects and the WB conducts post review.

The risk categorization of sub-projects is tentatively shared in this ESMF document, but in case of any change in the risk category, PCU, in consultation with PIUs, should discuss the new risk category with the WB and reach consensus.

7.6 Incorporation into Works Contracts

For all sub-projects, the site specific ESIAs, ESMPs, LM Plans and RPs will also be incorporated into the procurement documents. Respective construction and consultancy contracts for sub-project design and development shall include requirement to implement the site specific ESIAs/ESMPs to be prepared during implementation. These sections include potential impacts that may occur during the set of works in question and measures that the contractor needs to take to mitigate them.

7.7 Implementation of ESMPs for Sub-Projects

The contractor will develop site specific sub-management plans in line with the ESMP prepared for the sub-project, including OHS plans before construction. The contractor will:

- ensure that the construction work is complied with the approved ESMP and site-specific sub-management plans;
- control and minimize environmental and social impacts;
- ensure that all staff and workers understand the procedure and tasks in the environmental and social management program;
- submit a monthly report on ES issues, mitigation, and results throughout the construction period;
- promptly notify any accident and incidents, and keep an incident register at construction site throughout the Project life; and
- be responsible for the training of staff and workers regarding environmental, social and OHS issues and commitments within the scope of the approved ESA documents,
- develop and implement LMP with associated GM for workers.

7.8 Supervision and Monitoring

Role of PSC, PCU and PIUs in the supervision and monitoring is described below:

The PIUs in coordination and support from the PCU, will carry out regular supervision of the RIUs to ensure that the ESIA reports, ESMPs, SEPs, LMPs and RPs are being duly implemented and that GMs for stakeholders and for workers are accessible and functional. When PIU notices any problems in ESIA, ESMP or RP implementation it should inform the PCU and agree with it on steps to rectify these problems.

Regarding progress with implementation of the ESMPs, by direct support and supervision of the PIUs, the RIUs will report to their institutional PIUs who will report to PCU on monthly basis.

Specifically, for any significant environmental or social incidents (e.g., fatalities, lost time incidents, environmental spills etc.), the PIUs will inform the PCU immediately, , and the PCU will inform the World Bank about the incident within 48 hours after the occurrence of incident or accident.

The incident report including root cause analysis, precautions and compensation measures taken, will be prepared directly by the PCU in 30 business days. In order to investigate and report the incident, the PCU will compile a task force lead by a Chairperson who is directly appointed by the PSC. The draft incident report prepared by the task force will be refined and finalize by the central PCU and approved by the PSC will then forward to the to the World Bank within 30 business days after the occurrence of incident or accident.

The PCU will also report its findings to the WB in its biannual project progress reports or more frequently, as needed to bring issues to the attention of the World Bank. The Bank's Task Team for the project will, on occasion, and as required, also visit project sites as part of project supervision.

7.9 Implementation of ESMPs for Grants

During the implementation of Grant Programme under TULIP, a manual will be prepared compromising World Bank ESSs. It is assumed that the Grants Programme will have a subdued technical and financial magnitude (considering the fact that, majority of the proposed grant investments are involved providing farmers-in-need of livestock, improved shelter conditions, high value agricultural products, etc.) which do not impose serious E&S adverse impacts.

In order to ensure that the WB ESSs are met in the Grants Programme, regardless of financial or technical magnitude, the Grants Implementation Manual will include an annex on brief description of the WB ESS requirements and a brief scope of the ESMF as appropriate to the Grants Programme. In addition, a letter of commitment will be signed by each grant beneficiary and will be attached to the grant contract, indicating that the beneficiary will comply with the related WB ESS requirements.

Eligibility criteria for the grants program will be clearly indicated in the POM. The grant projects will be required to fill in ESMP checklists.

8 STAKEHOLDER ENGAGEMENT and GRIEVANCE MECHANISM

8.1 Principles of Stakeholder Engagement

Stakeholder Engagement Plans (SEPs) proportionate to the nature and scale of the proposed sub-projects will be prepared as an integral part of ES assessment.

The general setting for stakeholder engagement is provided in Stakeholder Engagement Framework (SEF). Public consultation activities (including Grievance Mechanism [GM], document disclosure, Monitoring and Evaluation [M&E]) will be carried out for each sub-project. Separate SEPs will be prepared in accordance with SEF principles for projects requiring ESIA and RP.

Records of meetings and consultations with stakeholders will be included in the draft and final ESF instruments.

Preparing and implementing a satisfactory SEP is the responsibility of the PIUs and regional/provincial directorates of IAs).

Stakeholder Engagement should include:

Transparent participation

It has a vital importance that all the information about the project that shared with the stakeholders in an open manner.

Sensitive participation

The stakeholder participation process should take into account the different and specific needs of various groups and communities.

Inclusive/ non-discriminatory participation

There should be no hierarchical structure in the stakeholder engagement; all the different community members, groups and communities should participate in the stakeholder engagement on equal basis irrespective of gender, ethnicity, and poverty. Additional ways of targeted engagement will be needed for disadvantaged and vulnerable groups.

Use of multi-participation channels

One of the main aims of the use of the multiple participation channels is the access creation for the people with different interests and needs. For example, one community that lucking access to media would get information about the stakeholder engagement mechanisms through village visits.

User-friendly engagement tools

In order to meet the transparency, Sensitivity and Inclusivity principles it is important that the engagement tools are accessible, understandable and not complicated. Otherwise disadvantaged groups, like people lacking formal education experiences or member of a marginalized groups would not be able to participate.

Extend of engagement tools

As well as accessible, diversified and understandable engagement tool also need to be well disseminated. Lack of wider dissemination would let some groups, communities or individuals who are affected by the project out of the process of engagement. Because of this, visual and written announcements need to be complemented by face to face verbal communication.

Gender sensitive language

Negative attitudes and statements against women reflect itself not only through physical behaviors but also through our “language”. Language has a cultural characteristic and is reproduced by women and men over generations. Therefore, the main focus is to ensure gender sensitive language and target group for gender sensitive communication is women and men community members and stakeholders.

8.2 Summary of Stakeholder Engagement Activities

Public Consultation Meetings (PCMs)

Meetings can be organized for document disclosure and information sharing and information verification. These meetings will be organized with measures that take the risk of epidemics into account. Meetings will be announced to the public and all other stakeholders at least one week in advance, through local newspaper advertisements and on the web. Meetings will be organized in places and conditions suitable for vulnerable groups. Under Covid-19 conditions, a guideline has been prepared for the measures to be taken during stakeholder engagement activities (please see SEF for the guidelines).

Distance Consultations in Line with Covid-19 Conditions

The OGM will adopt additional measures during the consultation, disclosure and validation of the ESF instruments, if the PCMs could not take place due to Covid-19 pandemic situation. As a national lock down is currently in place, electronic copies of the document will be disseminated via OGM’s official website. Official correspondence and electronic information sharing with stakeholders such as other public institutions has been carried on as usual. Feedbacks will be collected through official correspondences, online and paper based feedback forms, e-mail and through phone. As the public disclosure is limited to these channels due to outbreak, additional consultations will be conducted with Muhtars to ensure all PAPs are informed.

Additional measures to be taken during disclosing, call for feedback and receiving feedback stages due to Covid-19 conditions are presented in detail in SEF.

Grievance Mechanism (GM)

In accordance with the international requirements, a grievance mechanism will be established by OGM in order to receive, resolve and follow the concerns and complaints of the stakeholder including project affected people (PAPs) and disadvantages groups. OGM will be accessible for the stakeholders and respond to all grievances (complaints, requests, opinions, suggestions) at the earliest convenience. The most important point in the GM is to ensure that all grievances are effectively received, recorded and responded within a predetermined timeline and on the basis of their contents, by the public relations unit on the site, and that the corrective/regulatory action to be taken is acceptable to both parties. Such responses to the grievances would be satisfactory for both parties and activities would be followed and filers of the complaints would be informed on the outcomes of the corrective activities.

One of the most important features of the grievance mechanism is to integrate the complaints received through TRGM, DSI and KGM into the central GM.

GM, will also be prepared to include direct and contracted workers.

In SEF, how to set up and operate the GM is explained in detail. A separate GM for workers is detailed in the LMP.

Document Disclosure

OGM should disclose the project documents, both in Turkish and English ESF instruments, on the current website. These documents will be updated with the feedback received from the public. Draft reports, which are displayed for at least 15 days, take their final form after being updated with the feedback from the public.

The Environmental and Social Progress Reports which will be prepared separately for the Bolaman and Çekerek projects annually, will also be published on the project website.

Surveys, interviews and Focus Group Discussions

A participatory understanding will be adopted while making project-based planning in accordance with ESMF and RF and the participatory approach will be adopted in determining social and environmental impacts. Resettlement planning, household characteristics, income sources, land ownership and usage patterns, sensitivities of Project Affected People (PAPs) will be determined by various field studies.

Information and Communication

Visual materials may accompany the information sharing and consultation activities during the project preparation and implementation phases, if necessary. However, the most comprehensive and timely form of information sharing will be through the websites of both Bolaman and Çekerek projects. For this reason, great importance is attached to the popularization of these websites:

Bolaman: https://bolaman.ogm.gov.tr

Çekerek: http://cekerek.ogm.gov.tr

In addition, information exchange will continue throughout the project with the e-mail and telephone number provided in the contact section of the project website.

Coordination with Muhtars

The most important communication channels for communicating with local stakeholders are muhtars. For this reason, it is aimed to include muhtars in the project at every stage and to walk arm in arm with them both as project beneficiaries and as communication ambassadors.

Strategic Environmental and Social Assessment (SESA) Working Group

The SESA working group, established within the scope of SESA and composed of representatives of different groups (vulnerable groups, farmer leaders, women farmers, etc.), played a role in ensuring local participation in the environmental and social assessment of the project.

8.3 Preparation of Stakeholder Engagement Plans (SEPs)

The above principles and activities will be used in consultations on all components of both Bolaman and Çekerek projects. However, when in projects that require resettlement and environmental and social impact are expected the SEP, RP, ESMP and ESIA should be prepared.

The SEF provides (i) background information on both national and international regulation and requirements to be considered during execution of stakeholder engagement activities and preparation of the SEPs, (ii) preliminary stakeholder analysis and a stakeholder program, (iii) structure of the grievance mechanism to be established for the Project. The sub-project specific SEPs will be in line with but not limited to the initial assessments, overall structure and guidance presented in the SEF.

The objectives of the SEPs will be as follows:

- to establish a systematic approach to stakeholder engagement that will help the Borrower and the Contractors to identify all stakeholders and how they will be affected by the project and ensure that the project is implemented in a participatory and community-friendly manner through building and maintaining a continuous constructive relationship with them, in particular with project-affected peoples.
- to assess the level of stakeholder interest and support for the project and to guide the relations of the Project team with the stakeholders throughout the installation and operation process, enabling stakeholders' views to be taken into account in project design and environmental and social performance.
- to promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially create an impact.
- to ensure that relevant project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.
- to provide PAPs with accessible and inclusive means to raise issues and grievances and allow the Contractors to respond to and manage such grievances.

The SEP does not only identify the different stakeholder groups, but also identifies their needs and circumstances, and how they are being affected by the sub-projects. The SEP pays special attention to identified disadvantaged or vulnerable individuals or groups, and determines how to ensure their inclusion in the stakeholder engagement activities.

9 ESMF DISCLOSURE and CONSULTATION

This ESMF will be disclosed by OGM by means of presenting and opening to discussion in a Consultation Meeting, where the following institutions (internal direct institutional) are invited:

- General Directorate of Forestry (OGM)
- General Directorate of State Hydraulic Works (DSİ)
- General Directorate of Highways (KGM)
- General Directorate of Agricultural Reform (TRGM)
- Provincial Directorates of Agriculture and Forestry
- Regional Directorates of Highways
- Regional Directorates of DSİ
- Forest Regional Directorates
- Provincial Water and Sewerage Administrations
- OGM's:
    - Public Relations, Education and Research Department
    - Strategy Development Department
    - Department of Non-Wood Products and Services
    - Silviculture Department
    - Nursery and Seed Affairs Department
    - Forestry and Village Relations Department
    - Afforestation Departments
- FAO
- WB
- Interested NGOs and Project Affected People (PAPs) who live in the project areas

ESMF will also be disclosed to a broad range of local stakeholders with the use of the Project web site broadcasted by OGM.

The document will be finalized based on the questions and answers sessions held during the Consultation Meeting and the online feedbacks received.

10 MONITORING FRAMEWORK

Environmental and social monitoring system starts from the pre-construction phase, and continues during the construction phase of the project through the operation phase, verifying the implementation of the mitigation measures specified in the ESF instruments and assessing their effectiveness, thus enabling the WB and the Borrower to take action when needed.

The monitoring system provides:

- Technical assistance and supervision when needed;
- Early detection of conditions related to particular mitigation measures;
- Follow up on mitigation results; and
- Provide information of the project progress.

PIUs will monitor the environmental and social impacts of their project activities on a regular basis and report to PCU who will inform the World Bank.

The environmental and social issues included within the mitigation measures will also be monitored and supervised by the in-house designated staff of PIUs.

When RIUs notice any problems in ESIA, ESMP, LMP, RF, RP or SEP implementation, they will inform relevant PIUs and PCU and agree with them on steps to rectify these problems. Specifically, for any incident or accident related to the sub-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, the RIUs will immediately inform PIUs, who in turn will immediately inform the PCU who will report to the WB within 48 hours after the occurrence of incidents or accidents. In such cases, PIUs will 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. PIUs will prepare the incident report, including root cause analysis, precautions and compensation measures taken, to the PCU who will report to the WB within 30 business days after the occurrence of incident or accident.

Monitoring Frequency

RIUs' environmental and social experts together with OHS experts would be on site as the time interval defined in the ESMP (i.e. daily basis) in order to inspect sub-project site and verify compliance with all applicable mitigation measures defined in the ESMP. Environmental and social staff assigned for PIUs shall monitor the sites on quarterly basis during construction, depending on the sub-project scope. More frequent monitoring may be conducted if needed to ensure compliance with the mitigation measures and resolution of any issues that are noted. Depending on the activity, weekly, monthly, quarterly and semi-annual monitoring activities carried out by PIUs for E&S compliance will be reported regularly to the PCU that will carry out its supervision and monitoring as required for each sub-project and report to WB quarterly on the progress and updates.

The RIUs' ES personnel will be continuously present on site and will be reporting to the PCU quarterly through central PIUs.

Reporting to the World Bank

In its quarterly project progress reports, PIUs will include a section titled "Environmental and Social Standards" which will summarize the status of ESCP and compliance with ESF instruments and all sub-project specific plans such as ESIA/ESMP and RPs including, Labour Management Procedures and SEP implementation based on its monitoring activities. The

reports will also provide details of all grievances received (if any) during the relevant reporting period, including the number of grievances, types of grievances, dates received, and actions taken and pending/open complaints. Such reports will highlight any issues arising from non-compliance with environmental and social requirements and how it has been/is being addressed from the environmental and social safeguards point of view.

Monthly Compliance Reports

Environmental, Health and Safety (EHS) experts assigned for each PIU shall prepare and submit a monthly compliance report to PCU, in order to document construction and compliance activities completed during the month, and to track the resolution of any issues that may have occurred. The reports should include the following information for the period:

- Summary of completed construction activities
- Estimate of remaining construction and schedule
- Summary of compliance and monitoring activities (results of monitoring)
- Updated list of all EHS incidents that occurred during the project
- Follow up information from any past issues that are still being resolved
- Photographs of project activities related to implementation of ESMP mitigation measures
- Daily compliance checklist each day that work occurs in the field.

Quarterly Compliance Reports

PCU shall prepare and submit quarterly compliance reports to the World Bank to document construction and compliance activities completed during the period and to track the resolution of any issues that may have occurred, for all sub-projects under implementation. The PCU will compile their quarterly report based on RIUs daily compliance checklists and monthly compliance reports prepared by the PIUs.

The quarterly report should include the following information for the period:

- Key recommended follow up issues, actions, time frame and responsibility center
- An introduction, reporting period and monitoring locations
- Summary of completed construction activities
- Estimate of remaining construction and schedule
- Summary of compliance activities
- Progress to date in implementing the ESMF, including key aspects monitored: such as waste management, health and safety practices, procurement/storage/and use of pesticides including their disposal, dust management, water quality, other environmental incidents and accidents, environmental awareness and training undertaken, etc.
- Oversight activities (i.e., site visits) of PIUs and supervisory consultants
- Updated list of all EHS incidents that occurred during the project, including attached notices of non-compliance that were issued
- Follow up information from any past issues that are still being resolved.

Social Standards which will summarize the status of ESCP and compliance with ESF instruments and all sub-project specific plans such as ESIA/ESMP and RPs including, LM Planand SEP implementation based on its monitoring activities. The reports will also provide details to all grievances received (if any) during the relevant reporting period, including the number of grievances, dates received, and actions taken and pending/open complaints. Such reports will highlight any issues arising from non-compliance with environmental and social requirements and how it has been/is being addressed from the environmental and social safeguards point of view.

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ANNEXES

Annex 1: Screening Checklist

Annex 1-A: Sample Environmental Screening Form

Sub-project Information

Sub-project name	
Procurement Plan Item No	
Type of sub-project	
Implementing authority((ies)	
Location of sub-project (Neighborhood(s), District, Province)	
Brief Description of Sub-project activities: (construction and operation/implementation activities)	
Geographical coordinates of the Site:	
Area of land that will be used for the sub-project:	
Current Land use	
Land ownership	
Access routes to the Site	

Baseline Environmental Conditions

Is the sub-project site located on or adjacent to any of the following (Provide information for all sites and alignment of the project components/sub-components, associated activities; give details, mention distance to these features in km)

No	Environmental Aspects	Yes	No	Details
1.	Sensitive ecosystems			
2.	Natural habitats			
3.	Areas with protection status (cultural /archaeological /natural)			
4.	Critical habitats			
5.	Describe the soil and vegetation on site	n/a	n/a	

Sensitive Receptors

Are there sensitive receptors in the area of influence of the sub-project, such as:

No	Sensitive receptors	Yes	No	Details
1.	Housing units, schools, hospitals or other sensitive receptors			
2.	Culturally and/or socially important paths, areas/religious occupancies, burial grounds, tourist or pilgrim congregation areas, etc.			
3.	Drinking water sources (groundwater wells, springs, surface water resources)			
4.	Areas prone to flooding / landslides			
5.	Downstream communities			
6.	Areas affected by landslides			
7.	Other sensitive receptors			

Current Environmental Status

1.	Is the site in critical / over exploited condition?			
2.	Is the site covered with vegetation?			
3.	Is the site disaster-prone? If yes; list all disaster zone categories applicable.			
4.	Is the site suitable for proposed development?			
5.	Describe existing pollution or degradation in the site(s)	n/a	n/a	
6.	Any other remarks on baseline condition?			

Anticipated Environmental Impacts: Impacts on Land, Geology and Soils

Will the proposed sub-project cause the following on land / soil?

Item	Impacts	Yes / Maybe	No	Details
1.	substantial removal of top soil (indicate in sqm)			
2.	degradation of land			
3.	loss or impacts on cultural/heritage properties			
4.	physical changes in the project area (i.e. changes to the topography) due to cutting and filling, excavation, earthwork or any other activity			
5.	contamination or pollution of the Land? (indicate possible risks)			

Impacts on Water Environment

Will the sub-project or its components cause any of the following impacts on quantity or quality of water sources?

Item	Impacts	Yes / Maybe	No	Details
1.	Will the sub-project involve dredging in the river environment?			
2.	Impacts on availability and access to water resources			
3.	Pollution of water bodies/ground water nearby or downstream			
4.	Impacts on river flow patterns			
5.	Will the project result in stagnation of water flow or pondage?			

Impacts on Biodiversity

Will the sub-project or its components cause any of the following impacts on biodiversity?

Item	Environmental Impacts	Yes / Maybe	No	Details
1.	cutting of trees or clearing of vegetation?			
2.	habitat fragmentation due to the clearing activities? (i.e. hindrance to the local biodiversity like disturbing the migratory path of fish, birds, mammals, etc.)			
3.	potential nuisance of noise and light pollution or any disturbance on surrounding habitats			

Impacts on Communities

Will the sub-project or its components cause any of the following impacts on nearby communities?

Item	Environmental Impacts	Yes / Maybe	No	Details
1.	Health & Safety risks in nearby communities (major accident risks such as explosions, fires, toxic releases, etc.)			
2.	Potential noise/vibration to nearby communities			
3.	Potential damages to common property, roads, etc.			
4.	Potential risks of traffic accidents			

Impacts due to Storage and Wastes: Pollution and Hazards

Will the sub-project or its components cause any impact due to storage of materials, wastes or pollution due to releases during various project activities

Item	Type	Yes	No	Details
1.	Does the project include use or storage of dangerous substances (e.g., large quantities of hazardous chemicals/ materials like Chlorine, Diesel, Petroleum products; any other?			
2.	Will the project produce solid or liquid wastes; including construction/demolition wastes (including dredging, de-weeding wastes, muck/silt, dust); polluted liquids?			

Environmental Pollution

Will the process cause or increase the following?

Item	Type	Yes	No	Details
1.	Air pollution			
2.	Odor nuisance			
3.	Environmental noise			
4.	Visual blight or light pollution			
5.	Water pollution (surface waters, groundwater)			
6.	Coil contamination			
7.	Other types of impacts on the ambient environment			

Suggested Environmental Enhancement Measures

Has the sub-project design considered the following enhancement measures?

Item	Enhancement Measures	Yes	No	Details
1.	Energy conservation measures/ energy recovery options incorporated in sub-project design			
2.	Waste minimization or waste reuse/recycle options			
3.	Rainwater harvesting, water recycling and other water resource enhancement measures			
4.	Mitigations against extreme events, drought, flood, other natural disasters			
5.	License for water withdrawal from surface water source			
6.	Dredging permits			
7.	License for transportation and storage of diesel, oil and lubricants, etc.			
8.	License for transportation of hazardous wastes			

For sub-projects envisaging construction or rehabilitation of large dams and other water retaining structures, the following screening criteria should be applied to identify potentially High risk investments. Investments will be considered as High risk if one or more of the below criteria are answered “Yes”. For sub-projects rated as Substantial risk, and where specific “Yes/No” answer requires further investigation/analysis, risk categorization will be reconfirmed through site-specific ESIA based on the pre-mitigation risk assessment. Those activities which will be found of high risk through the below screening and/or site-specific ESIA, will be excluded from the project scope.

Item	Type	Yes	No	Details
1.	Dam with reservoir area (>1km2)			
2.	Dams with a height of 15 meters or greater from the lowest foundation crest or dams between 5 meters and 15 meters and impounding more than 3 million cubic meters			
3.	Presence of protected areas/rivers, valuable natural habitats, critical habitats in or in the vicinity of the proposed sub-project area			
4.	Presence of valuable aquatic species in the waterbody proposed for dam construction, rehabilitation/ multipurpose reservoir			
5.	Risk of significant habitat fragmentation			
6	Risk of major flow deviations downstream			
7.	Risk of significant water stagnation upstream			

Item	Type	Yes	No	Details
8.	Other water retaining structures on the same waterbody which might cause significant cumulative impact			
9.	Need for physical resettlement (> 200 households) *In cases where these is physical resettlement of fewer than 200 households, the World Bank will still assess the level of risk associated with the resettlement and closely monitor implementation*			
10.	Need for economic displacement (> 200 households) *(assessments can be done on a case by case basis by the Bank)*			

SUMMARY OF ENVIRONMENTAL SCREENING

Project Categorization and Need for ESF Instruments, Oversight

Project Category	☐ Low ☐ Moderate ☐ Substantial ☐ High
Key Reasons	
Safeguards Instruments Required	☐ ESIA and ESMP ☐ ESMP ☐ SEP ☐ RP ☐ LM Plan

Status	IA	Name, Signature with Date
Prepared by		
Checked and categorized as (low, moderate, substantial, high) by		
Reviewed and approved by		

Annex 1-B: Sample Environmental Screening Form

Land Acquisition and Livelihoods

Land Acquisition	Yes	No	Details
Does the sub-project require private land acquisitions?			
Was the land required for sub-project already acquired?			
Has the acquired lands been duly transferred and are there any litigation/legacy (pending for title transfer, compensation payment, ownership disputes etc) issues?			
Are there any complaints/unresolved cases of already acquired lands?			
Is it possible to purchase privately owned through Willing Buyer–Willing Seller agreement?			
Does the sub-project cause any access restriction to the commuters/pedestrians/ business and trades?			
Is land for material mobilization or transport for the civil work available within the existing plot/Right of Way?			
Are there any formal / informal users or non-titled people who are utilizing (inhabiting/doing business or using for other purposes etc.) the proposed site/project locations that will be used for civil work? If yes, please provide how many and for what purposes.			
Is any temporary impact likely on livelihoods of persons living on the land to be acquired?			
Is there any possibility to move out, close of business/commercial/livelihood activities of persons during constructions?			
Is there any case of temporary or permanent physical displacement of persons due to sub-project works?			
Does this project involve resettlement (physical displacement) of any persons? If yes, give details.			
Will there be loss of/damage to productive trees, fruit plants or crops that generate livelihood income for the households?			
Will there be loss of incomes and livelihoods for anyone due to project intervention?			
Will people permanently or temporarily lose access to facilities, services, or natural resources?			

Labor

Labor issues	Yes	No	Details
Will project cause loss of employments/jobs?			
Will project generate excessive labor influx as a result of new constructions?			
Does construction activities require additional/skilled labor from outside the locality?			
Will sub-project/construction activities cause destruction/disturbance to host community living?			
Will construction of new buildings, drainage lines, powerlines create any degradation/disturbances for public buildings/resources/ adjacent houses, wells, lands, burial places, children parks, schools etc.?			
Will this intervention generate downsize in current labor force (retrenchments) of the agency?			

Vulnerable Groups

Vulnerability issues	Yes	No	Details
Are there any vulnerable groups who may be affected adversely due to the sub-project?			

SUMMARY OF SOCIAL SCREENING

Project Categorization and Need for Safeguards Instruments, Oversight

Project Category	☐ Low ☐ Moderate ☐ Substantial ☐ High
Key Reasons	
Safeguards Instruments Required	☐ ESIA and ESMP ☐ ESMP ☐ SEP ☐ RP ☐ LM Plan

Status	Agency / Official	Name, Signature with Date
Prepared by		
Checked and Categorized as (low, moderate, substantial, high) by		
Reviewed and accepted by		

Annex 2: World Bank's Project Categorization

According to the World Bank's E&S Policy, projects (including projects involving FIs) 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.

A project is classified as ***High Risk*** after considering, in an integrated manner, the risks and impacts of the project, taking into account the following, as applicable:

- The project is likely to generate a wide range of significant adverse risks and impacts on human populations or the environment. This could be because of the complex nature of the project, the scale (large to very large) or the sensitivity of the location(s) of the project. This would take into account whether the potential risks and impacts associated with the Project have the majority or all of the following characteristics:

  (i) long term, permanent and/or irreversible (e.g., loss of major natural habitat or conversion of wetland), and impossible to avoid entirely due to the nature of the project;

  (ii) high in magnitude and/or in spatial extent (the geographical area or size of the population likely to be affected is large to very large);

  (iii) significant adverse cumulative impacts;

  (iv) significant adverse transboundary impacts; and

  (v) a high probability of serious adverse effects to human health and/or the environment (e.g., due to accidents, toxic waste disposal, etc.).

- The area likely to be affected is of high value and sensitivity, for example sensitive and valuable ecosystems and habitats (legally protected and internationally recognized areas of high biodiversity value), lands or rights of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities and other vulnerable minorities, intensive or complex involuntary resettlement or land acquisition, impacts on cultural heritage or densely populated urban areas.
- Some of the significant adverse ES risk and impacts of the project cannot be mitigated or specific mitigation measures require complex and/or unproven mitigation, compensatory measures or technology, or sophisticated social analysis and implementation.
- There are significant concerns that the adverse social impacts of the project, and the associated mitigation measures, may give rise to significant social conflict or harm or significant risks to human security.
- There is a history of unrest in the area of the project or the sector, and there may be significant concerns regarding the activities of security forces.
- The project is being developed in a legal or regulatory environment where there is significant uncertainty or conflict as to jurisdiction of competing agencies, or where the legislation or regulations do not adequately address the risks and impacts of complex projects, or changes to applicable legislation are being made, or enforcement is weak.
- The past experience of the Borrower and the implementing agencies in developing complex projects is limited, their track record regarding ES issues would present

significant challenges or concerns given the nature of the project's potential risks and impacts.

- There are significant concerns related to the capacity and commitment for, and track record of relevant Project parties, in relation to stakeholder engagement.
- There are a number of factors outside the control of the Project that could have a significant impact on the ES performance and outcomes of the project.

A project is classified as ***Substantial Risk*** after considering, in an integrated manner, the risks and impacts of the project, taking into account the following, as applicable:

- the project may not be as complex as ***High Risk*** projects, its ES scale and impact may be smaller (large to medium) and the location may not be in such a highly sensitive area, and some risks and impacts may be significant. This would take into account whether the potential risks and impacts have the majority or all of the following characteristics:

  (i) they are mostly temporary, predictable and/or reversible, and the nature of the project does not preclude the possibility of avoiding or reversing them (although substantial investment and time may be required);

  (ii) there are concerns that the adverse social impacts of the project, and the associated mitigation measures, may give rise to a limited degree of social conflict, harm or risks to human security;

  (iii)they are medium in magnitude and/or in spatial extent (the geographical area and size of the population likely to be affected are medium to large);

  (iv) the potential for cumulative and/or transboundary impacts may exist, but they are less severe and more readily avoided or mitigated than for High Risk projects; and

  (v) there is medium to low probability of serious adverse effects to human health and/or the environment (e.g., due to accidents, toxic waste disposal, etc.), and there are known and reliable mechanisms available to prevent or minimize such incidents.

- The effects of the project on areas of high value or sensitivity are expected to be lower than *High Risk* projects.
- Mitigatory and/or compensatory measures may be designed more readily and be more reliable than those of ***High Risk*** projects.
- The project is being developed in a legal or regulatory environment where there is uncertainty or conflict as to jurisdiction of competing agencies, or where the legislation or regulations do not adequately address the risks and impacts of complex projects, or changes to applicable legislation are being made, or enforcement is weak.
- The past experience of the Borrower and the implementing agencies in developing complex projects is limited in some respects, and their track record regarding ES issues suggests some concerns which can be readily addressed through implementation support.
- There are some concerns over capacity and experience in managing stakeholder engagement, but these could be readily addressed through implementation support.

A project is classified as ***Moderate Risk*** after considering, in an integrated manner, the risks and impacts of the project, taking into account the following, as applicable:

- the potential adverse risks and impacts on human populations and/or the environment are not likely to be significant. This is because the project is not complex and/or large, does not involve activities that have a high potential for harming people or the environment, and is located away from environmentally or socially sensitive areas. As such, the potential risks and impacts and issues are likely to have the following characteristics:

  (i) predictable and expected to be temporary and/or reversible;

  (ii) low in magnitude;

  (iii) site-specific, without likelihood of impacts beyond the actual footprint of the project; and

  (iv) low probability of serious adverse effects to human health and/or the environment (e.g., do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.).

- The project's risks and impacts can be easily mitigated in a predictable manner.

A project is classified as ***Low Risk*** if its potential adverse risks to and impacts on human populations and/or the environment are likely to be minimal or negligible. These projects, with few or no adverse risks and impacts and issues, do not require further ES assessment following the initial screening.

Annex 3: Generic Template for ESA documents

Annex 3 A: Indicative Outline of ESIA

Where an environmental and social impact assessment is prepared as part of the environmental and social assessment, it will include the following:

(a) Executive summary

- Concisely discusses significant findings and recommended actions.

(b) Legal and institutional framework

- Analyzes the legal and institutional framework for the project, within which the environmental and social assessment is carried out, including the issues set out in ESS1, paragraph 26.
- Compares the Borrower's existing environmental and social framework and the ESSs and identifies the gaps between them.
- Identifies and assesses the environmental and social requirements of any co-financiers.

(c) Project description

- Concisely describes the proposed project and its geographic, environmental, social, and temporal context, including any offsite investments that may be required (e.g., dedicated pipelines, access roads, power supply, water supply, housing, and raw material and product storage facilities), as well as the project's primary suppliers.
- Through consideration of the details of the project, indicates the need for any plan to meet the requirements of ESS1 through 10.
- Includes a map of sufficient detail, showing the project site and the area that may be affected by the project's direct, indirect, and cumulative impacts.

(d) Baseline data

- Sets out in detail the baseline data that is relevant to decisions about project location, design, operation, or mitigation measures. This should include a discussion of the accuracy, reliability, and sources of the data, as well as information about dates surrounding project identification, planning, and implementation.
- Identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions.
- Based on current information, assesses the scope of the area to be studied and describes relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences.
- Takes into account current and proposed development activities within the project area but not directly connected to the project.

(e) Environmental and social risks and impacts

- Takes into account all relevant environmental and social risks and impacts of the project. This will include the environmental and social risks and impacts specifically identified in ESSs2–8, and any other environmental and social risks and impacts arising as a consequence of the specific nature and context of the project, including the risks and impacts identified in ESS1, paragraph 28.

(f) Mitigation measures

- Identifies mitigation measures and significant residual negative impacts that cannot be mitigated and, to the extent possible, assess the acceptability of those residual negative impacts.
- Identifies differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable.
- Assesses the feasibility of mitigating the environmental and social impacts; the capital and recurrent costs of proposed mitigation measures, and their suitability under local conditions; the institutional, training, and monitoring requirements for the proposed mitigation measures.
- Specifies issues that do not require further attention, providing the basis for this determination.

(g) Analysis of alternatives

- Systematically compares feasible alternatives to the proposed project site, technology, design, and operation—including the "without project" situation—in terms of their potential environmental and social impacts;
- Assesses the alternatives' feasibility of mitigating the environmental and social impacts; the capital and recurrent costs of alternative mitigation measures, and their suitability under local conditions; the institutional, training, and monitoring requirements for the alternative mitigation measures.
- For each of the alternatives, quantifies the environmental and social impacts to the extent possible, and attaches economic values where feasible.

(h) Design measures

- Sets out the basis for selecting the particular project design proposed and specifies the applicable EHSGs, or if the ESHGs are determined to be inapplicable, justifies recommended emission levels and approaches to pollution prevention and abatement that are consistent with GIIP.

(i) Appendices

- List of the individuals or organizations that prepared or contributed to the environmental and social assessment.
- References—set out the written materials, both published and unpublished, that have been used.
- Record of meetings, consultations, and surveys with stakeholders, including those with affected people and other interested parties. The record specifies the means of such stakeholder engagement that were used to obtain the views of affected people and other interested parties.
- Tables presenting the relevant data referred to or summarized in the main text.
- List of associated reports or plans.

Annex 3 B: Indicative Outline of ESMP

An ESMP consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation of a project to eliminate adverse environmental and social risks and impacts, offset them, or reduce them to acceptable levels. The ESMP also includes the measures and actions needed to implement these measures. The Borrower will (a) identify the set of responses to potentially adverse impacts; (b) determine requirements for ensuring that those responses are made effectively and in a timely manner; and (c) describe the means for meeting those requirements.

Depending on the project, an ESMP may be prepared as a stand-alone document or the content may be incorporated directly into the ESCP. The content of the ESMP will include the following:

(a) Mitigation

- The ESMP identifies measures and actions in accordance with the mitigation hierarchy that reduce potentially adverse environmental and social impacts to acceptable levels. The plan will include compensatory measures, if applicable. Specifically, the ESMP:
    i. Identifies and summarizes all anticipated adverse environmental and social impacts (including those involving indigenous people or involuntary resettlement);
    ii. Describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;
    iii. Estimates any potential environmental and social impacts of these measures; and
    iv. Takes into account, and is consistent with, other mitigation plans required for the project (e.g., for involuntary resettlement, Indigenous Peoples, or cultural heritage).

(b) Monitoring

- The ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the environmental and social assessment and the mitigation measures described in the ESMP. Specifically, the monitoring section of the ESMP provides:
    i. a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements,
    ii. detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions;
    iii. monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

(c) Capacity development and training

- To support timely and effective implementation of environmental and social project components and mitigation measures, the ESMP draws on the environmental and social assessment of the existence, role, and capability of responsible parties on site or at the agency and ministry level.

- Specifically, the ESMP provides a specific description of institutional arrangements, identifying which party is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).
- To strengthen environmental and social management capability in the agencies responsible for implementation, the ESMP recommends the establishment or expansion of the parties responsible, the training of staff, and any additional measures that may be necessary to support implementation of mitigation measures and any other recommendations of the environmental and social assessment.

(d) Implementation schedule and cost estimates

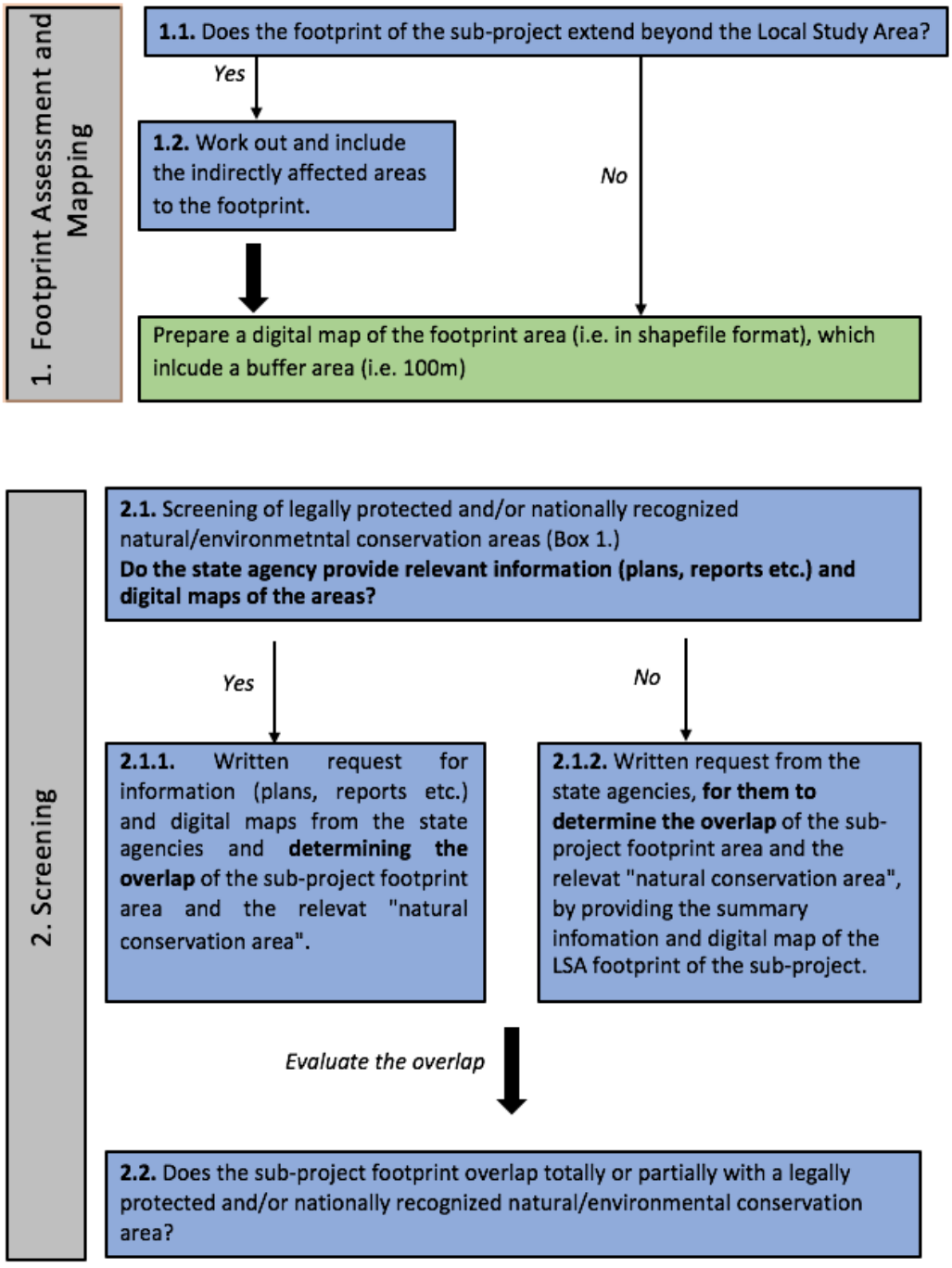
- For all three aspects (mitigation, monitoring, and capacity development), the ESMP provides
    i. an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans;
    ii. the capital and recurrent cost estimates and sources of funds for implementing the ESMP. These figures are also integrated into the total project cost tables.

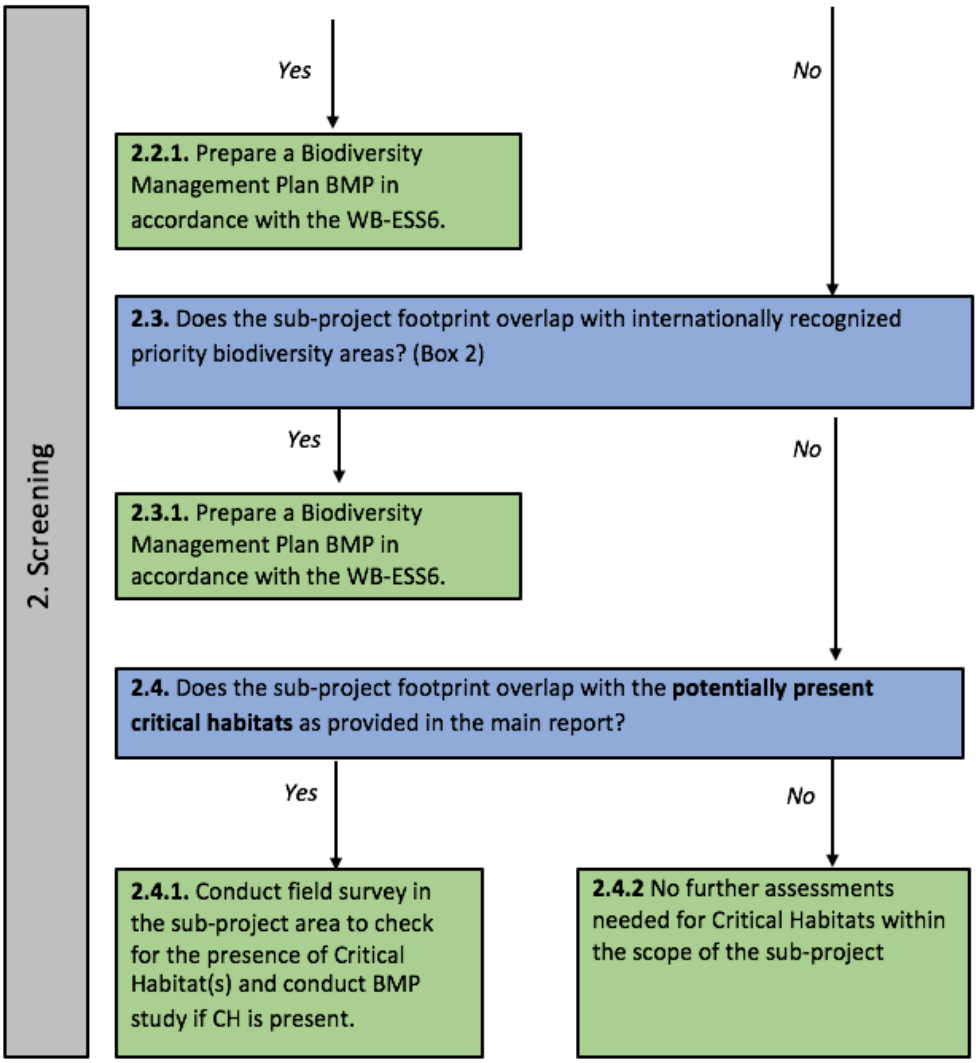
(e) Integration of ESMP with project

- The Borrower's decision to proceed with a project, and the Bank's decision to support it, are predicated in part on the expectation that the ESMP (either stand alone or as incorporated into the ESCP) will be executed effectively. Consequently, each of the measures and actions to be implemented will be clearly specified, including the individual mitigation and monitoring measures and actions and the institutional responsibilities relating to each, and the costs of so doing will be integrated into the project's overall planning, design, budget, and implementation.

Annex 4: Assessment Procedure for Designating Critical Habitats

Flowchart for assessing the presence of Critical Habitats in the sub-project areas and necessity to conduct Biodiversity Management Plans.




2. Screening
Yes
No
2.2.1. Prepare a Biodiversity Management Plan BMP in accordance with the WB-ESS6.
2.3. Does the sub-project footprint overlap with internationally recognized priority biodiversity areas? (Box 2)
Yes
No
2.3.1. Prepare a Biodiversity Management Plan BMP in accordance with the WB-ESS6.
2.4. Does the sub-project footprint overlap with the potentially present critical habitats as provided in the main report?
Yes
No
2.4.1. Conduct field survey in the sub-project area to check for the presence of Critical Habitat(s) and conduct BMP study if CH is present.
2.4.2 No further assessments needed for Critical Habitats within the scope of the sub-project

Box 1. Legally protected and/or nationally recognized natural/environmental conservation areas

A. Ministry of Agriculture and Forestry

a. General Directorate of Nature Conservation and National Parks

- Provincial Biodiversity Assessments

  Bolaman River Basin Project Area:

  1. From Fatsa to Aybastı 800 (Special Plant Area)
  2. Perşembe Plateau-1 (Special Plant Area)
  3. Perşembe Plateau-2 (Special Wildlife Area)
  4. Black Sea Coast (Special Wildlife Area)
  5. Ulugöl Nature Park-1 and -2 (Special Wildlife Area)

  Çekerek Basin Project Area:

To be obtained from General Directorate

- Natura 2000 Project Results

  To be obtained from the General Directorate
- Noah's Arc Database

  To be obtained from the General Directorate
- Legally Protected Areas:

  Bolaman River Basin Project Area:

  1. Ulugöl Lake Nature Park
  2. 12 Natural Monuments (monumental trees of oak, beech, plane and linden in Perşembe, Fatsa and Çatalpınar districts)

  Çekerek Basin Project Area:

  1. Kadıpınarı Nature Park
  2. Oluközü Nature Park
  3. Ulukavak Nature Monument

b. General Directorate of Forestry

- Forests Managed with Nature Conservation Function

  Bolaman River Basin Project Area:

  To be obtained from Giresun and Amasya Regional Forest Directorates (i.e. Protection Forests, Gene Conservation Forests, Seed Stands, Seed Orchards)

  Çekerek Basin Project Area:

  To be obtained from Giresun and Amasya Regional Forest Directorates (i.e. Protection Forests, Gene Conservation Forests, Seed Stands, Seed Orchards)

B. Ministry of Environment and Urbanization

a. General Directorate for Protection of Natural Assets

- Natural SITES

  Bolaman River Basin Project Area:

  1. Gaga Lake Natural SITE

Box 2. Internationally recognized priority biodiversity areas

A. Key Biodiversity Areas (KBA)[1]

Çekerek Basin Project Area:

1. Akdağmadeni Forest KBA
2. Ballıca Hills KBA
3. Kazankaya Valley KBA

B. Important Bird Areas (IBA)[2]

None present in Bolaman River Basin or Çekerek Basin

C. Important Plant Areas (IPA)[3]

None present in Bolaman River Basin or Çekerek Basin

D. Prime Butterfly Areas of Turkey[4]

None present in Bolaman River Basin or Çekerek Basin

E. Priority Biodiversity Areas for Black Sea and Anatolian Diagonal Systematic Conservation Plans[5]

None present in Bolaman River Basin or Çekerek Basin

F. Alliance for Zero Extinction Sites[6]

None present in Bolaman River Basin or Çekerek Basin

G. RAMSAR Sites[7]

None present in Bolaman River Basin or Çekerek Basin

1. http://www.keybiodiversityareas.org ;www.dogadernegi.org
2. http://datazone.birdlife.org/country/turkey/ibas ; www.dogadernegi.org
3. http://www.plantlifeipa.org/site/mapsearch ; http://www.obanettr.org
4. https://dkm.org.tr/uploads/yayinlar/1585519361057.PDF ; www.dkm.org.tr
5. http://www.nuhungemisi.gov.tr (Noah's Arc Database)
6. https://zeroextinction.org/site-identification/2018-global-aze-map/
7. https://www.ramsar.org/wetland/turkey