

TURKEY

**IRRIGATION MODERNIZATION
PROJECT
(P158418)**

**ATABEY PLAIN IRRIGATION
REHABILITATION PROJECT**

**ENVIRONMENTAL AND SOCIAL
MANAGEMENT PLAN (ESMP)**

JULY 2020



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Abbreviations

APIRP	Atabey Plain Irrigation Rehabilitation Project
ESMP	Environmental and Social Management Plan
WB	World Bank
DSİ	State Hydraulic Works Directorate General
EIA	Environmental Impact Assessment



1 Introduction

This Environmental and Social Management Plan (ESMP) has been prepared to set out the measures required to be taken to eliminate and/or mitigate to acceptable levels the environmental and social impacts that may be caused during the pre-construction, construction and operation stages of Atabey Plan Irrigation Rehabilitation Project (APIRP) planned to be carried out under the Turkey Irrigation Modernization Project. This ESMP aims at clearly defining by whom, when, how often and how the measures will be taken during the pre-construction, construction and operation stages. This ESMP has been prepared in compliance with primarily the laws and regulations of Turkey, in addition to the World Bank's policies and safeguards measures.

2 Project Description

The infrastructure investments to be financed primarily under Component 1 of Turkey Irrigation Modernization Project (TIMP) include the replacement of existing open channel systems (channel and distribution structures) with closed and pressurized systems. This component will be implemented by DSI, and will also include improved operations and maintenance, and capacity-strengthening support for Water User Associations (WUAs). The sub-project covered by this ESMP and to be implemented under TIMP consists of the construction works to be carried out under the rehabilitation of existing Atabey Irrigation Scheme and the operation of the irrigation scheme. The modernization project aims at addressing the operational problems, problems in the network, operation and maintenance difficulties in the channels, water leakages caused by the worn-out and deformed channels, and the failure to supply water to the desired points. As part of the construction activities, the existing open channels will be closed systems (piped and pressurized system) equipped with drip and sprinkle irrigation systems.

2.1 Project Location and Current State

The work for Atabey Plain Irrigation Scheme started in 1967 with the preparation of "Isparta Atabey Project Planning Report", followed by other studies and finally the "Atabey Project Additional Field Irrigation - Sevinçbey and Sav Planning Report". The construction of a significant part (80%) of the scheme was completed in 1974, and the system was completely commissioned in following years. After being commissioned, the system was taken over by WUA in 1998. Then the WUA undertook a series of activities to improve the systems efficiency in 2008, 2012 and 2016.

The project area is located 15 km north of Isparta Province in the western Mediterranean Region, in the "lakes region" of Turkey. It is surrounded by Sav county, Küçükgökçeli, Büyükgökçeli, Eğirdir-Sevinçbey Villages, Atabey district and Gönen district. The elevation of the project area ranges between 995 - 1,100 m. It extends 20 km on the East – West axis and 8 km in the North- South axis (see Figure 1).

At present, the 4,200 kW Bedre Pumping Stations installed nearby the lake pumps water to an elevation of 44.50 meters, with a tunnel of 4231 m, a main channel of 104,996 m and 447,985 m long secondary and tertiary channels (concrete coated open channel and canalette). Atabey Irrigation Area and the units are given in Annex -1.

The facility has almost completed its economic and physical life and it needs to be rehabilitated inevitably; the networks installed using old technologies is causing both a low irrigation rate (32.5%) and a low irrigation efficiency (37%). Given that the local people have a remarkable tendency towards fruit and vegetable cultivation and irrigated agriculture using drip / sprinkle irrigation, and their persistent requests for the rehabilitation of the facility, it has been decided to replace the system with and underground-pressurized-piped network.

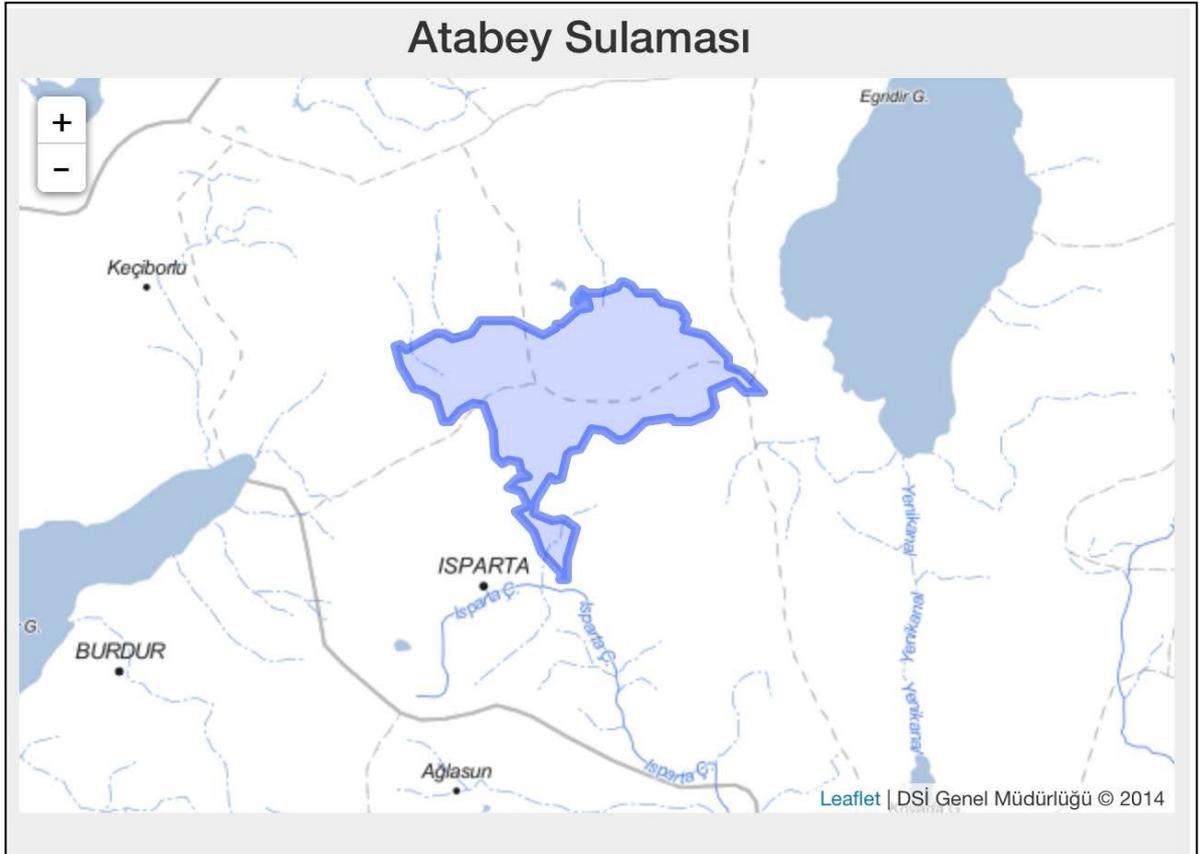


Figure 1. Atabey Irrigation Project Area

2.2 Project Components

The water to be used under the project will be supplied from Lake Eğirdir, as is currently done under the existing irrigation system. In this context, Water balance sheet studies have been conducted for Lake Eğirdir. According to "Lake Eğirdir Hydrology Revised Report, May 2002", under which water balance sheet studies have been conducted, 871.85 hm³ of water enters the basin per year. Considering the evaporation loss, calculated to be in the range of 503.78 hm³ per year, and the drinking water need for Isparta province in the range of 30 hm³, the remaining 338.07 hm³ of water is transferred to the existing irrigation systems for irrigation purposes. Information on irrigation from Lake Eğirdir is presented in Table 1 below. The irrigation modernization projects carried out in the basin are envisaged to ensure a significant water saving, and once all irrigation schemes are modernized, the amount of water to be supplied from Lake Eğirdir will decline to the level of 220-250 hm³ per year.

As shown in Table 1, the amount of water currently abstracted from the basin for Atabey Irrigation Scheme is 106.55 hm³ per annum. The modernization project is anticipated to ensure a 35 percent saving.

Table 1. Irrigation projects using Lake Eğirdir as Source of Supply

Name of Irrigation Scheme	Need for Irrigation Water (m³/ha/year)	Gross area (ha)	Net area (ha)	Amounts to be abstracted annually (hm³/year)
Senirkent	6,724	12,834	11,030	74.17
Gelendost	7,442	5,966	5,208	38.76
Boğazova	8,762	2,500	1,800	15.77
Hoyran	7,052	4,286	3,715	26.20
Barla	7,264	367	320	2.35
Gönen-Keçiborlu	6,369	7,413	6,672	42.50
Tokmacık-Çaltı	4,556	4,487	3,815	17.42
Atabey	8,557	13,834	12,451	106.55
Rural Services	7,718	1,694	1,433	11.06
TOTAL:		53,384	46,444	334.78

Atabey Irrigation Modernization Project

According to the project formulation, the water to be pumped by the Bedre Pump Station which will replace existing Bedre I and Bedre II Pumping Stations near by Lake Eğirdir, will be taken into the closed pipe system to be installed beginning from the outlet of Atabey Tunnel and the area will be irrigated with the help of 6 pumping stations and irrigation network. The project will irrigate a total agricultural area of 13,834 ha using an underground pressurized pipe network of approximately 410 km, consisting of HDPE, CTP and steel pipes with diameters of 100 - 2600 mm. This network will also have approximately 500 single-outlet and 1,200 double-outlet irrigation hydrants and also some 5,000 control, regulation and safety valves. The following activities are planned to be carried out under Atabey Irrigation Project.

1. Bedre-I and Bedre-II pump stations, which are owned by DSI, will be replaced by Bedre Pump Station platform and power house with the total capacity of Bedre-I and Bedre-II Pump stations which will be constructed in the area where existing two are located. Bedre-II Pump Station will be used during the irrigation season while the new Bedre Pump Station construction continues. The Bedre-II pump station will be demolished after the Bedre Pump Station becomes operational. The water taken from Lake Eğirdir between the elevations of 918.96 – 914.62 m and pumped to the elevation of 960.25 m by the Bedre Pump Station to be constructed will be transferred to the tunnel inlet using a transmission line with length of 1,080 m and grade of $j= 0.0005$. Some of the water will be taken to the main transmission line at the elevation of 959.58 m before the tunnel, to irrigate the agricultural lands in Bedre Plain. Bedre main transmission line has a length of 6,037 m, initial flow rate of $0.326 \text{ m}^3/\text{s}$, initial diameter of 800 mm and uses HDPE pipes.
2. The water taken from Lake Eğirdir between the elevations of 918.96 – 914.74 m and pumped to the elevation of 960.25 m by the Bedre pumping station will be taken to left and right shore transmission lines at the outlet of the 4,231 m long existing tunnel at the water elevation of 955.18 m, and the areas down the existing right and left shore classical channels (right and left shore gravity irrigation) will be irrigated by the pressurized pipe system. Within the scope of the project, a headpond at the water elevation of 955.18 m in order to diverse the water to the main transmission line will be constructed. The agricultural lands with classical channels on the right and the left bank will be irrigated via the main transmission line. The main transmission line has a length of 22,759.41 m, initial flow rate of $10.488 \text{ m}^3/\text{s}$, initial diameter of 2,600 mm and uses CTP pipe.
3. At the 0+662.19 km of the main transmission line at the exit of the headpond, water will be released to the existing Büyükgökçeli pumping station suction pond at 2+713.00 km of the Y-3 standby line. The water taken at the elevation of 953.50 m will be pumped to the elevation of 1,000.00 m by the existing Büyükgökçeli pumping station and supplied to Büyükgökçeli main transmission line to irrigate the agricultural lands in Büyükgökçeli settlement area. Büyükgökçeli main transmission line has a length of 4,417.20 m, initial flow rate of $0.495 \text{ m}^3/\text{s}$, initial diameter of 710 mm and uses HDPE pipe.
4. At the 5 + 117.72 km of the Y-34 standby line diverging at the 13+210.06 km of the main transmission line at the exit of the headpond, water will be released to the Sav pumping station suction pond. The water taken at the elevation of 940.79 m will be pumped to the elevation of 995.00 m and supplied to Sav main transmission pipeline to irrigate the agricultural lands in Sav settlement area. Sav main transmission line has a length of 8 + 624.90 m, initial flow rate of $0.995 \text{ m}^3/\text{s}$, initial diameter of 1400 mm and uses CTP pipe.
5. The water taken at the headpond outlet at the elevation of 955.18 m is pumped to the elevation of 1,012.00 m using the existing Harmanören II pumping station, and will be released to the existing open channel at the southeast which diverges water to Sevinçbey Pumping Station. At km 5+576 of the right shore main transmission pipeline that goes southeast from Harmanören II pumping station, the water will be pumped to the elevation of 1.070,00 m from the elevation of 994.00 m at the existing Sevinçbey pumping station, and taken into Sevinçbey main transmission line to irrigate the agricultural lands in Sevinçbey settlement area. Sevinçbey main transmission pipeline has a length of 4 + 717.71 m, initial flow rate of $0.282 \text{ m}^3/\text{s}$, initial diameter of 710 mm and uses



HDPE pipe.

6. At the existing tunnel outlet, the water taken at the elevation of 954.22 m of Harmanören I pumping station at the supply line at the km 0+ 160 of the standby line diverging at the km 0 + 985,25 of the right bank main transmission line was used to be:

- a. Elevated to P1 main transmission line with the elevation of 1020.00 m through existing pumping station
 - b. Elevated to P2 main transmission line with the elevation of 1030.00 m through existing pumping station. However, the agricultural lands with the water supply from P1 and P2 elevated from Harmanören I pumping station are assessed within the scope of Atabey Akçay Lagoon Irrigation Area, and will be irrigated with the gravity.
7. The existing Harmanören III pumping station at the km 5 + 821.25 km of P2 main transmission line, the water is taken at the elevation of 1019.14 m and elevated to 1085.00 m which ends up with the Harmanören III main transmission line. However, the agricultural lands with the water supply from Harmanören III pumping station are assessed within the scope of Atabey Akçay Lagoon Irrigation Area, and will be irrigated with the gravity.

Project duration has been envisaged as six years and the construction schedule is given in Annex - 2. Since the irrigation area is large and dispersed construction activities will be carried out in groups so that the existing irrigation operations are not disrupted, to the extent possible.

Construction Site

In order to run the system soundly and in a controlled manner, the construction site facilities will be organized as a central (main) construction site and additional mobile or temporary support units where necessary. The size of envisaged central construction site is approximately 2,600 m².

Service Roads

Service roads have been designed as 10 m wide stabilized surface road, as a standard road section (width). It is anticipated that a total of 4,500 m long road will be constructed in the construction site, of which 1,000 m will be for access to the camp site, 1,000 m for the aggregate pit, and 2,500 m within the construction site and for access to places of work.

Borrow Pits

The 10,000 m³ concrete aggregate materials to be used for the facilities proposed in the project, and the 300,000 m³ cushion fill (sand) required for protection of pipes can be purchased from the following crushed stone sites or natural sand-cobblestone pits. It is anticipated that the concrete aggregate can be obtained from two separate places close to the project area. The characteristics of these borrow pits and the physical characteristics of materials at these sites, as examined through laboratory tests, are outlined below.

Atabey - Medini Creek Borrow Pit Area: It is located between the grid lines 06000 - 07000 and 93000-94000 of the Isparta M25-a2 map section scaled 1/25 000, in the north of Atabey district, 3.5 km away from the district center, around Karahanlımlar fountain on the left bank of Medini Creek. The material pit is being operated by the private sector and a ready-mixed concrete plant is being operated nearby the borrow pit. There is an asphalt road between the project area and the borrow pit. The project area is 5 km away from the borrow pit at the closest point and 25 km at the farthest point. The characteristics of material at the borrow pit is suitable for concrete production.



Sand Pit Site on Isparta-Antalya Highway: It is located between the grid lines 82000 - 83000 and 87000- 88000 of the Isparta M25-a4 map section scaled 1/25 000, in the east of Isparta settlement area, approximately 1 km to the Isparta - Antalya beltway exit, nearby the Isparta Creek coming from Isparta city center. The material pit is being operated by the private sector. A sifting and washing plant is being operated within the sand pit site. There is an asphalt road between the project area and the borrow pit. The project area is 3 km away from the borrow pit at the closest point and 25 km at the farthest point. The characteristics of material at the borrow pit is suitable for ready-mixed concrete production and for use of cushion sand.

Other Facilities and Structures

Field examinations have revealed that there is no creek that negatively affect the project area, and thus need to be rehabilitated, in terms of flood, erosion and drainage. The karstic geology and high permeability of the project area have been analyzed, and no drainage requirement is envisaged.

Excavation materials storage areas may be needed to store the excess materials to come out from the channel excavation works during the project construction activities. If such an area is needed, DSİ will apply to the related municipality and/or Isparta Provincial Environment and Urbanization Directorate for determination of the appropriate storage area.

3 Legal Framework and Applicable World Bank Safeguard Measures

This section sets out the requirements of laws and regulations as well as the World Bank safeguard measures taken into consideration when preparing the ESMP.

3.1 Legal Framework

ESMP has been prepared in compliance with the laws and regulations of Turkey primarily, as mentioned in Section 1.

Environment Law No. 2872, published in the Official Gazette of Republic of Turkey no. 18132 dated 11 August 1983, and amended through Law No. 6486 published in the Official Gazette dated 29 May 2013, is Turkey's primary framework for environmental legislation and is supported with many regulations. Article 10 of Environment Law draws the overall framework of the Regulation on Environmental Impact Assessment (EIA Regulation), published in the Official Gazette no. 29186 dated 25 November 2014. However, irrigation projects are not covered by the Turkish EIA Regulation. For this reason, irrigation projects are exempted from the EIA process. On the other hand, as part of the European Union membership process, Turkey has made many institutional and legal reforms. Thanks to these reforms, environmental legislation and environmental safeguards have been aligned with the international standards. The regulations concerning construction activities are listed below, but the applicable regulations are not limited to these.

- Waste Management Regulation, published in Official Gazette no. 29314 dated 2 April 2015;
- Regulation on the Incineration of Wastes, published in Official Gazette no. 27721 dated 6 October 2010,
- Regulation on the Control of Hazardous Wastes, published in the Official Gazette no. 25755 dated 14 March 2005, and most recently revised in the Official Gazette no. 28812 dated 5 November 2013;
- Regulation on the Control of Waste Oils, published in the Official Gazette no. 26952 dated 30 July 2008 and most recently revised in the Official Gazette no. 28812 dated 5 November 2013;
- Regulation on the Control of Vegetable Oils, published in the Official Gazette no. 29378 dated 6 June 2015;
- Regulation on the Control of Package Wastes, published in the Official Gazette no. 28035 dated 24 August 2011;
- Regulation on the Control of Used Batteries and Accumulators, published in the Official Gazette no. 25569 dated 31 August 2004 and most recently revised in the Official Gazette no. 28812 dated 5 November 2013;
- Regulation on the Control of Medical Wastes, published in the Official Gazette no. 25883 dated 22 July 2005 and most recently revised in the Official Gazette no. 28948 dated 21 March 2014;



- Regulation on the Control of Excavation Material, Construction and Demolition Wastes, published in the Official Gazette no. 25406 dated 18 March 2004 and most recently revised in the Official Gazette no. 27533 dated 26 March 2010;
- Regulation on the Control of Worn-out Tires, published in the Official Gazette no. 26357 dated 25 November 2006 and most recently revised in the Official Gazette no. 29292 dated 11 March 2015;
- Regulation on Sanitary Landfilling of Wastes, published in the Official Gazette no. 26357 dated 27533 dated 26 March 2010 and most recently revised in the Official Gazette no. 29292 dated 11 March 2015;
- Communiqué on the Recovery of Certain Non-Hazardous Wastes, published in the Official Gazette no. 27967 dated 17 June 2011 and most recently revised in the Official Gazette no. 29292 dated 11 March 2015;
- Regulation on the Control of Waste Electrical and Electronic Devices, published in the Official Gazette no. 28300 dated 22 May 2012;
- Regulation on Control of Soil Pollution and Areas Contaminated by Point Sources, published in the Official Gazette no. 27605 dated 8 June 2010 and most recently revised in the Official Gazette no. 28704 dated 7 June 2013;
- Regulation on the Control of Water Pollution published in the Official Gazette no. 25687 dated 31 December 2014;
- Regulation on the Monitoring of Surface Waters and Ground Waters, published in the Official Gazette no. 28910 dated 11 February 2014;
- Regulation on the Protection of Ground Waters from Pollution and Degradation, published in the Official Gazette no. 28257 dated 07 April 2012;
- Regulation Amending the Regulation on the Control of Pollution Caused by Hazardous Substances on in Water and Environment, published in the Official Gazette no. 26005 dated 26 November 2005;
- Regulation on Waters for Human Consumption, published in the Official Gazette no. 25730 dated 17 February 2005
- Urban Wastewater Treatment Regulation, published in the Official Gazette no. 26047 dated 01 January 2006;
- Regulation on Evaluation and Management of Air Quality, published in the Official Gazette no. 26898 dated 06 June 2008;
- Regulation on the Reduction of Ozone-Depleting Substances, published in the Official Gazette no. 27052 dated 12 November 2008;
- Regulation on Evaluation and Management of Ambient Noise, published in the Official Gazette no. 27601 dated 04 June 2010;
- Regulation on Equipment and Protection Systems used in Potentially Explosive Environments, published in the Official Gazette no. 26392 dated 30 December 2006.

In addition to the environmental laws and regulations, there are many other laws involving environmental assessments directly or indirectly and thus are applicable to the project. Therefore, these laws and regulations also apply to the Project. These legal arrangements include the following:

- Law on Ground Waters (Law no. 167), published in the Official Gazette no. 10688 dated 23 December 1960;
- Law on the Protection of Cultural and Natural Assets (Law No. 2863), published in the Official Gazette no. 18113 dated 23 July 1983;
- Highways Traffic Law (Law No. 2918), published in the Official Gazette no. 18195 dated 18 October 1983;
- Highways Traffic Regulation, published in the Official Gazette no. 23053 dated 18 July 1997;
- Regulation on Opening and Operation of Workplaces, published in the Official Gazette no. 25902 dated 10 August 2005;
- Regulation on Buildings to be Constructed in Disaster Prone Areas, published in the Official Gazette no. 26582 dated 14 July 2007;
- Regulation on Buildings to be Constructed in Seismic Zones, published in the Official Gazette no. 26454 dated 06 March 2007;
- Regulation on the Transportation of Hazardous Substances via Highways, published in the Official Gazette no. 28801 dated 24 October 2013;
- Regulation on Principles and Procedures Governing the Production, Import, Transportation, Storage, Sale, Use, Disposal and Control of Non-Monopoly Explosives, Hunting Materials and the Similar, published in the Official Gazette no. 19589 dated 29 September 1987;
- Regulation on Septic Tanks Constructed in Districts without Sewerage System, published in the Official Gazette no. 13783 dated 19 March 1971.

The EIA Regulation in force requires limited and project-specific assessment of social impacts. In this context, it does not satisfy international standards. Still, through the reforms implemented in recent years, some legal arrangements that will help manage social impacts have been added to the legislation. Some of these are listed below:

- Law on Occupational Health and Safety (No. 6331), published in the Official Gazette no. 28339 dated 30 June 2012, and other relevant regulations
- Regulation on Sub-Employers, published in the Official Gazette no. 27010 dated 27 September 2008

In terms of involuntary resettlement, some of the relevant legal arrangements of Turkey are listed below:

- Expropriation Law no 2942, published in the Official Gazette no. 18215 dated 8 November 1983, and other relevant regulations
- Law No. 4650 on the Amendment on Expropriation Law, published in the Official Gazette no. 24393 dated 5 May 2011

Nature Conservation and National Parks Directorate General of Ministry of Forestry and Water Affairs governs protected areas in Turkey. On the other hand, for protection of physical cultural assets, the relevant legal arrangement is defined under Law No. 2863 dated 21.07.1983 on the Protection of Cultural and Natural Assets (revised through the amendment issued on 27.07.2004 dated Official Gazette). This legal arrangement is aligned with international standards. Furthermore, Regulation on Researches, Drillings and Excavations in Relation to the Cultural and Natural Assets, which was published in the Official Gazette No. 18485 dated 10.08.1994 define the procedures and obligations concerning the cultural and natural assets found out during construction. In addition, Regulation on Planning for Protected Areas dated 23.03.2012, Regulation on Identification, Registration and Approval of the Protected Areas dated 19.02.2013 and Regulation on Implementation of Environmental Protection Projects by Environmental Protection Agency for Specially Protected Areas (dated 24.0.21992) are the other arrangements within the scope of the legal framework on protected areas. DSI is responsible for the project to be implemented in compliance with the laws and regulations.

Atabey Irrigation rehabilitation Project is located in Lake Eğirdir basin and uses Lake Eğirdir as the source of water supply. Lake Eğirdir is under protection by the related legal framework. In this context, Lake Eğirdir Protection Plan has been prepared in coordination with the Water Management Directorate General of Ministry of Forestry and Water Affairs, and in addition to the environmental legislation listed above, Lake Eğirdir Protection Plan, Lake Eğirdir Special Provisions and discharge standards provided in the attachment of the plan must also be complied with during the construction and operation stages. At the same time, World Bank's Safeguard Policies and the standards and criteria specified in the Environment, Health and Safety Guidelines also constitute a part of project standards.

3.2 World Bank's Safeguard Policies

The World Bank's environmental and social safeguard policies require the borrower country to conduct an Environmental Assessment in compliance with the EIA Regulation and the World Bank's operational policy on environmental impacts (OP 4.01). In this direction, this Environmental and Social Management Plan (ESMP) has been prepared to fulfill their requirements of the World Bank's policies on Environmental Assessment (OP 4.01) and Physical and Cultural Resources (OP 4.11). The objective of this plan is to assess the project according to its potential social and environmental impacts and define environmental and social management conditions.

OP 4.01 Environmental Assessment:

Activities carried out in the scope of simple construction works, by their nature, create environmental and social impacts which are not very critical, within the existing project boundaries. WB's Operational Policy on Environmental Assessment has to be applied even if the impacts are not very critical. Together with the implementation of OP 4.01, environmental and social management instruments have to be prepared.

The ESMF includes a consideration of the broader impacts of the transformation of the open-channel irrigation systems to "closed" water systems, as well as mitigation measures to address any negative

impacts. Moreover, the ESMF aims to address water utilization and potential impacts on resource sustainability, communities and other water users.

The key social and environmental impacts that may be caused by the project are expected to affect the sensitive recipients near the project area (e.g. schools, hospitals, health centers, houses). In this context, the whole project area and surrounding areas have been evaluated in terms of vulnerable recipients. It is expected that the negative environmental and social impacts are limited to basic construction work impacts. In general, major impacts are related to excavation, waste disposal, disposal of demolished material, loss of topsoil and vegetation, dust formation, noise, occupational and community health and safety. The project uses Lake Eğirdir, which is under protection according to Turkish legislation, as the water supply source. However, since the project will reduce the amount of water abstracted from Lake Eğirdir, it is expected to have a positive impact on the lake. Implementation of the project will contribute 71.88 hm³/year of water to the water balance of Lake Eğirdir. Since it is anticipated that these negative impacts are temporary and reversible, are mostly limited to the construction site and that the project is exempt from EIA Regulation pursuant to the Turkish environmental legislation, the project is considered to be Category B project.

Natural Habitats OP/BP 4.04:

The existing Atabey Irrigation Scheme, which is planned to be modernized, uses Lake Eğirdir as the source of water supply. Lake Eğirdir is one of the important wetlands of Turkey and is under protection. In this context, Water Management Directorate General of Ministry of Forestry and Water Affairs has executed Lake Eğirdir Special Provisions and Basin Protection Plan Project and developed a Protection Plan. The Special Provisions of Lake Eğirdir were approved by Ministry of Forestry and Water Affairs on 08 May 2012. The general provisions call for the installation of pressurized irrigation systems and prioritize projects for this purpose, within three years from the publication of special provisions for specific basins. Furthermore, for the irrigated agricultural lands outside the basin to which irrigation water is supplied, drip irrigation method has to be adopted within the periods specified in the Implementation Program of Basin Protection Plan, in line with the views of the Provincial Food, Agriculture and Livestock Directorate. From this perspective, The objective and components of TIMP are aligned with the Special Provisions of Lake Eğirdir. Apart from this, the domestic wastewater discharge standards, stipulated in Annex 1.1, will be complied with throughout the project implementation period.

The Protection Plan basically sets out the scope of the activities aimed at protecting Lake Eğirdir, in addition to the provisions required to be complied with across the basin. The first priority of special provisions determined for the protection of Lake Eğirdir is to preserve the quantity and quality of the water flowing into the basin. For this reason, the primary objective of the modernization of irrigation schemes using Lake Eğirdir as their source of water supply is to reduce the quantity of water abstraction from the lake. At the same time, through the new and modern irrigation systems that will be introduced by the modernization project, such as drip irrigation systems, drainage water to flow into the lake from agricultural lands will have been prevented. Thus, it is anticipated that pollutant convection from agricultural lands will have been minimized. Irrigation modernization project is included in the Action Plan prepared for Lake Eğirdir. In this context, Lake Eğirdir will be positively affected from the project although it is a wetland under protection.

Physical Cultural Resources OP/BP 4.11:

Triggering of this policy will depend on the outputs of the project preparation stage. The laws and practices in Turkey satisfy the requirements of WB. DSI is responsible for avoiding or mitigating impacts on physical or cultural resources of the financed projects. Therefore, DSI will not proceed with sub-project funding until all requirements of the Turkish legislation are met. Since the national legislation on the protection of cultural assets is strictly implemented, an additional condition beyond the WB safeguard policies is not expected. However, a chance find procedure including responsibilities for managing accidentally discovered or chance find cultural artifacts, which will warn the supervision consultants and contractors about the steps to be followed, will be implemented. Additionally, all relevant official letters to be exchanged before or during construction activities will be recorded and annexed to periodic monitoring reports.

Involuntary Resettlement OP/BP 4.12:

The project involves the conversion of open channel systems (channels and distribution structures) with closed pressurized systems. The project team will assess whether the construction activities to be undertaken for the replacement or expansion of these channel systems would result in an involuntary land acquisition, land rental, temporary land use or crop loss, during the project preparation phase. OP 4.12 will be triggered if any such situation is identified..

Safety of Dams OP/BP 4.37:

There is no dam project affected under the project.

Projects on International Waterways OP/BP 7.50:

Lake Eğirdir basin is a closed basin and is not an international waterway.

In addition to applicable OP's presented above, the World Bank Group General Environmental Health and Safety Guidelines are also applicable for this project and shall be followed when relevant.



4 Environmental and Social Background

This section discusses the current environmental and socioeconomic characteristics of project area and its environs. The information provided in this section has been compiled from the studies conducted and results reports prepared so far in the region.

4.1 Geographical Formations and Geology

The project area is a closed basin surrounded by mountains in the north, east, south, southwest and northwest. The only opening of the basin is the 4 km long corridor opening to the Lake Burdur Basin in the west. The noteworthy hills and mounts in the project area are Kırdağ, Hüyüktepe, Kocatepecik, Asartepe, Sırçalıtepe, Çalicatepe, Hıdırlıktepe, Tavşantepe, Harmanören Hüyüktepe, Tuztaştepe extension and Kaştepe. The largest plains in the project area are Isparta, Atabey and Sevinçbey. Overall grade of the basin is from north and south in the north of the basin, and from south and north in the south of the basin. The most sunken part of the region is in the middle of Kuleönü, Bozanönü and Bayat villages.

The region, located in West Taurus region, around Isparta and Lake Eğirdir, hosts Beydağları autochthone consisting of autochthonous rock units and Antalya Nappes consisting of allochthonous rock units, Yeşilbarak Nappe and Likya Nappes. There are also neo-autochthonous Miocene-Quaternary rocks. The sedimentary rock units outcropping in the project area are generally thin-moderate layer. Jurassic-cretaceous and Triassic limestones which are widespread from place to place are moderate-thick layers. There are too many deformations in layers since the region is very active and is exposed to strong tectonism. While apparent foldings are not seen in the project area, there are small foldings seen in the detritics of Eocene and Miocene as a result of strong tectonism. Because the region is very active, too many joints and fractures have developed in all limestones from Permian to Miocene, but an apparent systemization is not observed. In the region which is exposed to strong tectonism, there are common faultings in the Triassic, Jurassic and Cretaceous limestones that form the dominant group of lithology between Atabey and Lake Eğirdir in particular, and also in the contacts of these units with other units. Faults are often characterized as gravity faults, but there are also strike-slip faults from place to place. The project area is located in first degree seismic zone in the Map of Seismic Zones published by Ministry of Public Works and Settlement in 1996.

4.2 Water Resources and Hydrogeology

The project area does not have resources with high flow rates. Since plain is a closed basin and is bordered with impermeable barriers, most of the creeks end in the basin. Sevinçbey Creek, Akçay Creek, Kurtlu Creek, Uludere, Mazılı Creek, Kazankaklık Creek are some of the creeks in the plain. Existing creeks mostly flow in their own beds seasonally and disappear in the plain and they do not pose any flood risk. However, because the project area is surrounded by mountains, measures have been considered to protect agricultural lands from slope waters during times of excessive rainfall. It has been planned to direct these waters to the Right and Left-Bank main channels of Atabey Irrigation Scheme currently in operation, and then to pump the rainfall directed to the right-bank to the existing Gönen Drainage Canal opened by DSİ in past years, and to pump the rainfall directed to the left-bank

main channel to the existing Lağus Diversion Channel opened by DSİ in recent years. Furthermore, although high levels of ground water and flood problems are not observed due to water returning from irrigation even under current conditions, the new system will not have any return water and the rain waters from the surroundings will be diverted to cut-off channels and thus there will not be any drainage and flood problem in the irrigation area.

The project's water supply source is Lake Eğirdir. It is the second largest natural lake used for irrigation purposes in Turkey, after Lake Beyşehir. It is fed by Gelendost, Pupa Creek, Çaydere and Hoyran creeks and many other smaller creeks. There are dolines in the lake. Lake Eğirdir also provides irrigation water to many other irrigation schemes, including Senirkent, Gelendost, Bogazova, Hoyran, Barla, Gonen-Keciborlu, and Tokmacik-Calti. The lake also provides water supply to Isparta city center.

4.3 Soil Composition

The soil composition in the project area consists mainly of alluvial soil in terms of formation, broken apart from the surrounding mounts and carried to the base lands through water in time. There are also small amounts of colluvial soil on slopes. Soils are rich in lime, but poor in organic matter. According to land classification results, 13,403 ha out of the 14,823 ha land is irrigable, 431 ha is temporarily non-irrigable and 989 ha is non-irrigable under category 6.

4.4 Climatic Features

A highland version of Mediterranean climate prevails in the project area. Summers are hot and dry, winters are cold and wet, with annual precipitation amounting to 400-450 mm. Annual average temperature has been recorded as 12 °C. The lakes in the region have a significant impact on the climatic features.

4.5 Flora and Fauna

Within the boundaries of province of Isparta, there are 3 families, 7 species under 3 types from Ferns (Pteridophyta); 7 species and sub-species under 2 families and 3 types from Gymnospermae; and 1,566 species and sub-species under 76 families from Angiospermae. There are 64 medically significant plants and 103 economically significant plants.

Amphibians may be seen in the province of Isparta often in areas where wetland plants such as reeds are common in lakes and ponds, and also near stagnantly flowing waters and ponds or wet stony areas inside forests. The pollution in wetlands in recent years, the rapid decrease in the size of these areas, and the release of different fish species in aquatic bodies have caused significant declines in the population density of amphibians. Within the boundaries of the province of Isparta, reptiles may be seen in stony and rocky areas inside forests, sunny areas covered with leaves, nearby water bodies and in-forest open and bushy areas, open, bushy and stony areas adjacent to forest borders, cultivates areas such as fields and orchards and settlement areas. Birds can be seen nearby water bodies, dense or sparse woodlands, open areas outside forest borders, gardens and orchards. Since Turkey is located on the migratory routes of birds in spring and autumn, the number of birds in these habitats increase during these months. Since some of the migratory birds stay in the region, the number of bird species is greater in summer than in winter.

Within the boundaries of the province of Isparta, mammals may be seen in sparse and dense woodlands, bushes, forest areas with rich base flora, amidst arborous plants, bushes and their roots nearby water bodies in forests, amidst in-forest stony, large rocky areas, caves, holes and decaying trees, open areas outside the boundaries of marshes and woodlands, close to cultivated areas and in settlement areas. The province of Isparta hosts a wide variety of mammal species. However, some of these species may not always be seen in the province since they have a very large living area and migrate regularly.

4.6 Sensitive Areas

In the province of Isparta, Kovada National Park has an area of 6,534 ha within the boundaries of Eğirdir and Sütçüler. It was declared as a national park in 1970. Kırıntı, Yuvalı, Serpil, Yukarıgökdere, Akbelenli villages and parts of Sütçüler Karadiken villages are attached to the district of Eğirdir.

Furthermore, Kızıldağ National Park is located within the boundaries of Şarkikararağaç, Yenişarbademli and Kurucuova districts, covering a total area of 59,600 ha. It was declared as a national park on 20 February 1993. The boundaries of National Park covers two districts (Şarkî karaağaç-Yenişarbademli) and 13 village settlements. Pınargözü Cave is located in the Yenişarbademli section of Kızıldağ National Park.

The wetlands in the province of Isparta are Lake Eğirdir, Lake Gölcük, Lake Kovada, Lake Beyşehir and Lake Karagöl. Furthermore, Sütçüler district hosts a rich variety of vegetation and wildlife, in addition to the Nature Park in Yazılı Canyon. There is also a historical inscription with archeological value, but not yet researched yet, in Yazılı Canyon. Again in Sütçüler, Kuzini Cave is another natural asset of Isparta province. In Yukarıgökdere Village, there is Kasnak Oak Nature Conservation Area. This conservation area, which is 366 km away from Isparta province and 32 km from Eğirdir district, 27 bird species have been identified in addition to common species such as eagle, falcon, hawk, partridge, ouzel, fieldfare besides mammals such as wolves, jackals, lyncean, bores, rabbits, foxes. Floristic analysis has also been conducted in the field and 218 plant species were identified. In the Zindan Creek region of Aksu district, Zindan Cave is a first degree archeological protection site. On the other side of Lake Eğirdir, in Sarıidris county, İnönü Cave and surroundings are also recorded as cultural and natural assets of the province of Isparta.

According to the Ministry of Forestry and Water Affairs sources, there is no conservation area within the irrigation area. The closest conservation areas are Kovada National Park (32 km), Isparta-Gölcük Nature Park (20 km), Kasnak Oak Nature Conservation Area (20 km) and Lake Burdur wetland and wildlife development site (20 km). Project implementation is not expected to cause an impact on these areas.

4.7 Socioeconomic Status

4.7.1 Population

The project area covers agricultural lands from the districts of Atabey and Gönen; counties of Sav, Büyükgökçeli, İslamköy and Kuleönü, and villages of Bedre, Büyükhacılar, Küçükacılar, Aliköy, Yazısöğüt, Küçükgökçeli, Sevinçbey, Harmanören, Bayat, Pembeli, Senirce and Bozanönü, partly or completely. The population of these settlement units are shown in Table 2 below.

Table 2. Population of settlement units in the project area

Settlement unit	Population in 2000 Census	Population in 2007 Census	Population in 2017 Census
Atabey	9703	6209	3997
Aliköy	1314	1196	1340
Bozanönü	562	533	547
Büyükgökçeli	1635	1907	1366
Küçükgökçeli	253	219	220
Büyükhacılar	1099	1084	1118
Küçükhacılar	772	434	-
Kuleönü	2510	2467	2413
Savköy	3294	3605	-
Yazısöğüt	395	416	-
Harmanören	415	345	313
Bayat	72	77	80
İslamköy	2046	1100	897
Pembeli	100	81	91
Sevinçbey	240	213	220
Gönen	10826	7775	3346
Senirce	454	476	501
TOTAL	35690	28137	16662

As shown in the table, the total population of settlement units in the project area, which was around 35,000 in 2000 declined to 28,000 in 2007 and to 16,662 in 2017, down by 30 percent. There is a rapid population decline in Atabey, Eğirdir and Gönen. However, a rapid growth has been recorded in the population of the city center of Isparta in recent years. In the region, which lives primarily on agriculture, it has been found that the rapid population loss is due to insufficiency of irrigation system. Gender distribution is almost the same in all districts: 50 percent men and 50 percent women. Age averages show an aging population in Atabey, Eğirdir and Gönen. The population is increasing during summer months and decreasing during winter months. Average household size is 3,5 people during winter months, <and 4,4 people during summer months.

4.7.2 Education

There are primary and secondary schools in Atabey, Gönen and Eğirdir and average classroom size is 9 students in Atabey, 17 in Eğirdir and 22 in Gönen. These districts also have vocational and technical secondary schools as well.

4.7.3 Health Services

There is a hospital of with a capacity of 755 beds in the center of Isparta.

4.7.4 Infrastructure Services

All settlement units are served with drinking water, electricity and sewerage systems.

4.7.5 Sources of Livelihood

According to the study conducted, agriculture is the main source of livelihood. The most important agricultural crops that generate economic income are barley, wheat and oat. Furthermore, orchards are another source of income in the region. Animal husbandry has been recorded as a secondary source of income.

4.7.6 Agricultural Labor Force

Although the agricultural labor force includes women as well (mostly as land owner), men seem to have a dominant share in the labor. Some households with access to sufficient irrigation deal with greenhouse cultivation. Some households have reported that they have shifted their sourced of livelihood from fruit and vegetable cultivation to animal husbandry due to insufficient irrigation and high costs. The rate of women in the labor force has increased in line with the increase in animal husbandry. This is considered to be due mainly to greater role assumed by women in feeding and caring for the livestock.

Land owners need agricultural labor force periodically. They need seasonal labor force for harvesting and land arrangement purposes. The need for labor force for irrigation is relatively smaller. Seasonal workers come to these districts together with their families in April-May and September-October. Per diem workers are sourced from the nearby settlement units. While the income for male workers is 60-70 TL/day, the income for female workers is 50-60 TL/day. Children only help their families.

4.7.7 Land Use and Plant Pattern

As part of the studies conducted, only the farmer registration system data could be accessed. In his context, Atabey WUA, which has an area of 12,587 ha, has 46,4 percent of its land in 5 settlement units attached to Atabey. Of these lands, 5,509 ha is registered with Atabey WUA, of which 2,714 ha is used for irrigated agriculture. The project area has 16,350 parcels and average parcel size is 0,3 ha. According to the farmer registration system, rain-fed irrigation is applied in an area of 5,509 ha and the most important crops are barley, vetch and wheat. The most important crops of irrigated agriculture are alfalfa, poplar, corn and sugar beet.

5 Environmental and Social Impacts

Air Quality: Dust formation is expected during the construction and site preparation stages of the project due to the stripping of top soil layer and other excavation works. These impacts are envisaged to be temporary and reversible. Furthermore, exhaust emissions are expected to originate from construction machines and equipment. necessary measures will be taken against dust and exhaust gas emissions. In this scope, construction machines and equipment will be periodically maintained and controlled. Thus, these impacts are expected to be at a low level. However, in case the emission levels are negatively affecting the nearby communities or other sensitive receptors, further corrective measures will be taken.

Noise: The noise to be generated by construction equipment and vehicles is expected to negatively affect the sensitive receptors in the close vicinity of the project. In order to minimize the impact, construction activities will be carried out during daytime hours (07:00 – 19:00). In addition, noise levels will be monitored at the sensitive receptors regularly and necessary mitigation measures will be taken if required.

Water and wastewater: Water requirement is anticipated to be mostly due to daily domestic water use of workers on campsites and construction sites. Water may also be necessary if concrete preparation works are implemented on site. DSI and the contractor are responsible for supplying water without stressing the groundwater and surface water sources for domestic use and concrete preparation works. The quality of the water (for domestic use and concrete preparation works) will be monitored regularly.

Wastewaters will generally be originated from the campsites in domestic wastewater form. These wastewaters shall be either stored in impermeable septic tanks in compliance with local regulations and the Bank requirements, will be regularly stored by licensed companies and will finally be discharged to receiving bodies after being treated.

Community health and safety: The campsites will introduce workforce to the nearby communities, who will inevitably interact with each other. Thus, the location of campsites must be positioned as far possible as from the local communities. Furthermore, workforce will be informed about the behavioral and ethics code through their contractual obligations.

Furthermore, construction activities will result in increase in the local traffic due to the vehicles going in and coming out from the construction site. The construction sites could potentially cause risk of accidents for local people, compromising community health and safety, if not fenced appropriately and marked with appropriate warning signs.

Occupational Health and Safety: The construction activities may pose risk to workers' health and safety if necessary precautions are not taken. In this context, DSI and contractors will be responsible for supplying a safe and healthy working environment for the workers. The workers should be aware of their job descriptions, responsibilities and relevant occupational health and safety risks. Necessary personal protective equipment and job-specific and occupational safety trainings will be given to the workers, regularly. The campsites should also be equipped with necessary facilities for the workers to meet all their needs.

Hazardous materials: For the time being, fuel filling and vehicle maintenance activities are not planned to be carried out on the construction site within the scope of the project. However, such need may arise if heavy vehicles are used on the construction site. DSI and contractors will be informed about the

storage and use of hazardous materials to be used in this scope and will take necessary measures. Furthermore, chemical spills and other potential hazardous substance accidents will be added to the possible scenarios under emergency management plans, and the required equipment will always be kept ready and relevant drills will be carried out regularly.

Waste management: The modernization of open channel irrigation system includes removal of the existing materials and pipes from the construction sites, eventually making them idle. The pipes and other materials that become idle need to be appropriately stored and finally disposed of in accordance with local regulations and the Bank requirements.

After Bedre-I Pump Station is demolished, the pumps and the other mechanical and electrical equipment will be transported to the scrap yard of DSI 18th Regional Directorate. Excess waste material will be transported to the Eğirdir Municipality waste site, which is 5.5 km away from the pump station. The necessary measures should be taken by the contractor to prevent damage to the agricultural lands and premises around due to factors such as dust and noise that may arise during demolition.

As the topsoil will be stored and reused for rehabilitation works after construction, no excavation waste is expected to be generated. However, in case the excavated material will be excessive, coordination with relevant authorities for appropriate disposal of excavation material shall be established.

In addition to excavation wastes, domestic and hazardous wastes are also expected to be generated during construction. These wastes will be stored separately at the construction and camp sites, as required by local regulations, and will be transferred to / disposed of by licensed facilities. DSI and its contractor will be responsible for coordinating with these licensed companies and ensuring that wastes are disposed/recycled in compliance with relevant local regulations and the Bank requirements.

Natural Habitats: The project uses Lake Eğirdir, which is under national protection status, as the water supply source. However, since the implementation of the project will reduce water abstraction from the lake by 71.88 hm³/year, its impacts are expected to be positive. Besides, Lake Eğirdir Protection Plan, Lake Eğirdir Special Provisions and discharge standards provided in the attachment of the plan must also be complied with during the construction and operation stages.

Infrastructure: Modernization works will require the use of existing access roads. The project design will also benefit from the ongoing land consolidation activities since it will allow for new common roads to be established to access each parcel that will also undergo the modernization activity. Damages to road surfaces during transport of heavy machinery will be rehabilitated by the construction contractor. Should any damages on infrastructure occur on private land due to construction, mitigation measures specified in the LAPF will be put into practice by the construction contractor. Any campsite that will be established during construction will secure its own infrastructure without placing an additional demand on community infrastructure during construction. Thus, impacts on local infrastructure are considered to be negligible.

Land acquisition: No resettlement activity is envisaged for the implementation of the project. However, depending on the construction activities, economic displacement may be involved. In line with the project principles, state-owned lands will be used to the extent possible by avoiding private



properties and agricultural lands. However, where this is not possible, land acquisition action plans will be prepared and implemented for the project area.

Assets and land based livelihoods: As there will be no physical displacement under the project; loss of structures and buildings are not expected. However, though kept to a minimum, the project may result in loss of agricultural land. The design of the subprojects considers following the existing irrigation network in addition to utilizing existing roads with minimum need for additional access roads. Depending on the status and current use of the land required for the project; loss of standing crops and trees with economic value is anticipated. To reduce the amount of land required, the land

consolidation practices carried out earlier by MoFAL will be utilized. Furthermore, project activities are expected to also impact land based livelihoods since majority of the land subject to modernization is used for agricultural purposes. Measures to mitigate both loss of assets and livelihoods are discussed in detail under the LAPF and will be managed via LAPs for each scheme that necessitates land acquisition.

Farmers, local community and other stakeholders including vulnerable groups: Considering that the project could improve the efficiency of the existing irrigation system, it is expected to have a positive impact on local communities in general. In particular, WUA members (land owners, tenants, etc.) will benefit directly from the project. Other stakeholders such as water users who are not WUA member but still benefit from the irrigation scheme, users using ground water for irrigation, users far from the WUA, users who are not eligible for WUA membership and land owners who have rented out their lands will have more water available to them as a result of the improved efficiency of Lake Eğirdir and the whole irrigation scheme. Furthermore, they are expected to consider becoming WUA member.

Agricultural workers (i.e. seasonal and daily workers, Syrian workers) and women engaged in agricultural practices who are also categorized as vulnerable groups may also be affected from the project since the project may result in limiting the labor demand for irrigation as well as cultivation and harvesting of products. The SIGA identifies Syrians under Temporary Protection among the seasonal migrant workers. The anticipated indirect impact on these groups is that irrigated large scale production may trigger need for increased number of seasonal workers. Yet, due to use of machinery, need for temporary workers may decrease. Seasonal workers travel with their families and engage in farming as a family. In the area of the Project, where seasonal agricultural workers are used children do not work as paid labor however can assist their families while working together. This type of child labor is not a form of forced labor as the national labor law forbids worst forms of child labor. SIGA identifies that women are not presented equally in land ownership and membership to WUAs. Hence, as per the Stakeholder Engagement Plan (SEP), continuous consultation both by DSI and WUAs will be carried out to inform all PAPs including vulnerable groups on project impacts and construction schedule as well as their rights for compensation should they suffer from loss of land or livelihood due to the project activities. Mitigation measures for such groups have been dealt within LAPF and site specific measures will be applied through LAPs.

Gender: Irrigation modernization, with its expected change to higher value crops and modern technologies, thus provides an economic opportunity for women who play an active role in agriculture. There are no legal restrictions on female tenancy arrangements or land ownership. However, customary traditions limit women's cultivation of shared ancestral land. Land consolidation practices, on the other hand, may positively impact this situation as an opportunity is created for women to own consolidated parcels, which likely may lead to their increased participation in agricultural production. Female water users in the WUAs could be both tenants and land owners. Women's role in WUA management and decision making is thus extremely limited and is perceived to be a domain for men. Cultural factors and social norms also hinder women's participation in meetings and training events related to irrigated agriculture. In order to decrease women's hesitance to take part in WUA management and decision making periodic stakeholder consultations will be arranged by WUAs and DSI field staff as part of irrigation modernization or regular WUA operations. With the collaboration and support of the Bank, DSI's field staff will design and deliver sensitization training on gender

aspects of irrigation in the subject project. This training will support DSI field offices and the WUAs under their supervision to implement measures to narrow the above gender-gaps in line with the Stakeholder Engagement Plan (SEP), such as ensuring that WUA consultation meetings specifically for women will be held (before, during the land consolidation and after irrigation modernization). The training will also lay the foundation for WUAs to develop their own measures to encourage women involvement in WUA governance and measures to allow female farmers to benefit from services, like agricultural advice/training, delivered through the WUA, in collaboration with DSI (on-farm water management), and MoFAL. DSI will monitor gender disaggregated data in terms of the female water users benefiting from the Project, and gender-disaggregated feedback from the monitoring reports and surveys carried out in the subprojects. Where feasible, DSI's MIS (SUTEM) will ensure that some gender-disaggregated data will be collected.

Labor conditions, influx and child labor: A campsite will be established for the project area. Each campsite will include infrastructure such as water, electricity, sewage and communication network. The campsite will be accessible by road network and will use existing roads to the extent possible. In cases where accommodation is provided on-site, DSI will ensure that contractors have a code of conduct as well as providing training on communication with local communities for workers prior to employment. On site facilities (i.e. sanitary facilities and canteen) will ensure compliance with Bank standards. The Project will fully comply with requirements of the Turkish Labor law, which is in compliance with principles of international labor standards, most of which is ensured through compliance with ILO Conventions Turkey is party to. Therefore; child labor, forced labor and discrimination (of race and gender) will not be tolerated.

Cultural assets: At this stage of the project, no impact is envisaged in connection with cultural assets. A chance find procedure will be developed in accordance with the Turkish legislation, and the relevant authorities will be contacted in case of a chance-find to enforce the applicable legislation.

6 Mitigation Measures and Monitoring Plan

The potential environmental and social impacts that may arise during the project construction stage, measures to be taken to manage these impacts and the monitoring plan are presented in Table 3 and Table 4, respectively. The tables contain all details including the type of potential impact, at what stage of the project they may arise, and what measures must be taken to control the impact.

Grievance Redress Mechanism

DSI has a four level grievance system in place in addition to the national GRM system (Prime Ministry and Presidency Communication Centers) that is also used to submit grievances. DSI, through its additional efforts will make arrangements to collect scheme specific grievances to be addressed and resolved during project implementation. Concerns, requests and complaints of project-affected stakeholders on both environmental and social impacts of the project will be dealt with through GRM.

Information on pre-construction works (land consolidation, land acquisition etc.), construction schedule and availability of project GRM will be disclosed to affected communities through consultations and other engagement activities, DSI official website as well as through regional directorates, relevant provincial branches and through WUAs.

Due to the nature of the sub-projects, project affected communities may have concerns regarding the planning, design and implementation of TIMP. DSI will engage Public Relations Expert(s) for



disseminating information regarding the grievance mechanism. Grievances to be communicated under the Project will be addressed at four levels:

- WUA level (settlements);
- Provincial directorate level
- Regional level
- National Level (through Headquarters and national GRM system)

Although there is no obligation, a Public Grievance Form has been prepared for convenience, and is presented in Annex-5. All the complaints and concerns received through the grievance system will be archived and the related issues will be attempted to be solved or mitigated within a predefined timeframe. The statistics of grievances will be regularly reported to the WB.

Similar to ESMF, site-specific ESMPs will also be prepared and disclosed for public information in both English and Turkish in a timely manner to allow the interested stakeholders to review and comment before the public consultation meetings. After revision of the site-specific ESMPs in accordance with the comments from the communities, the final versions will also be available for public review.



Table 3. Measures to be taken during construction stage

Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Pre-Construction:				
Workforce and Camps	<ul style="list-style-type: none"> Siting and operation of work camps should be undertaken in consultation with local authorities and communities. To the extent possible, work camps should not be located in close proximity to local communities. When preparing the campsites, the vegetated soil layer (approximately 30 cm) will be scraped and stored in a suitable area. After the completion of construction work, this vegetated soil layer will be used for restoring the campsite. In order to prevent potential conflicts between the local people and project employees, consultation must be maintained with the local people and complaints from people must be taken into consideration. The workforce to be employed under the project must be trained about the sensitivities of local people and a policy of “work ethics and moral values” must be prepared and attached to the contracts of employees. Recruit unskilled or semi-skilled workers from local communities to the extent possible. Provide adequate lavatory facilities (e.g. toilets and washing areas) should be provided for the number of people to work in the work site. The wastewaters to originate from the camp sites must be appropriately discharged to receiving bodies pursuant to the local legislation and the WB Safeguards Policies. Campsite must have necessary infrastructural arrangements such as electricity, water, sewerage, communication network as well as proper accommodation facilities (dormitory, canteen) for the workers that will accommodate on site. Campsites must have the areas and equipment (waste bins, containers, etc.) required for recovery, temporary storage and disposal of solid wastes in accordance with the related local legislation. Waste disposal through incineration shall be avoided in the campsites. When selecting the areas to store fuel, hazardous chemicals, hazardous wastes, etc., sensitive receiving bodies such as surface waters will be taken into account and sufficient distance shall be maintained from these areas (e.g. 50 meters to surface waters). If fuel filling and vehicle maintenance works will be carried out in the campsites, these areas shall be prepared in compliance with regulations, and their grounds shall be made impermeable to prevent soil pollution (through concrete coating, etc.). Fuel filling areas will be equipped with oil and chemical absorbing equipment, etc. to prevent contamination through accidental spills. Fuel tanks will be placed in fully-impermeable pools in compliance with the regulation. The workers staying in the campsite will be provided with domestic water compliant with the related regulations and standards. The drinking and domestic waters supplied to the camp sites will be regularly analyzed (weekly or monthly). 	Included in design, no additional cost.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Temporary storage areas, excavation material disposal areas, and other areas.	<ul style="list-style-type: none"> The existing open channel materials to be removed from the site under irrigation modernization and their demolition materials, will be removed from site, stored and disposed of in accordance with the Regulation on the Control of Excavation Material, Construction and Demolition Wastes (OG no. 25406 dated 18 March 2004). Since the earth to be excavated from the areas where underground irrigation pipes will be laid will mostly be used for backfill, a large amount of excavation waste is not expected to be generated. In case temporary excavation waste are generated, they will be stored in areas permitted by the related local authority, in compliance with the Regulation on the Control of Excavation Material, Construction and Demolition Wastes (OG no. 25406 dated 18 March 2004). The topsoil layer of temporary storage areas and excavation material disposal areas will be stripped and conserved for use in restoring these areas. The soil remaining in areas that cannot be restored (e.g. excavation and demolition materials storage areas) may be sent to areas needing it in coordination with the related Agriculture Directorates. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents



Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	<ul style="list-style-type: none"> Where the project requires a crushing, sifting and/or concrete plant, required permits will be obtained for these units within the framework of the EIA Regulation. 			
Fuel filling and vehicle maintenance	<ul style="list-style-type: none"> As a general principle of the project, fuel filling or vehicle maintenance processes will not be carried out in the construction site. Fuel filling or vehicle maintenance processes will be carried out at special areas or facilities designated for these purposes outside the site. However, in case heavy work machinery is used (e.g. crawler excavators and loaders) it may not be possible to carry out the fuel filling and maintenance processors for these vehicles outside the site. In such cases, the area where such processes will be carried out shall be equipped with all equipment and instruments required for response to a potential spill. (oil pans, oil and chemical absorbents, etc.). The Contractor shall be obliged to prepare all procedures, and provide and document 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. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Land consolidation and land take.	<ul style="list-style-type: none"> Private properties and agricultural lands will be avoided to the extent possible. Public lands will be utilized where additional land is required. Land consolidation will be made use of in places where applicable. Where expropriation is inevitable, site specific Land Acquisition Plans will be prepared and implemented in accordance with the LAPF. Land consolidation carried out by DSI will be implemented according to OP 4.12 and any cases requiring mitigation measures will refer to Entitlement Matrix in LAPF or to the site specific LAP (in any) Site-specific LAP will be appropriately implemented. 	Included in the planning cost. No additional cost.	DSI	
Public Participation and Access to Information	<ul style="list-style-type: none"> ESMP and LAP will be disclosed to the public so that people can easily access and comment on it. The information on the Grievance Redress Mechanism will be introduced to the people. Consultation meetings will be organized with local people including vulnerable groups and other relevant stakeholders about project components and project activities. Special arrangements will be made for the inclusion of women farmers/ water users. People will be informed about traffic arrangements, construction activities etc. Announcements, disclosure of documents will be made in public places accessible to women and other possible vulnerable groups. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Construction Stage				
Waste Management and Hazardous Wastes	<ul style="list-style-type: none"> Measures will be taken to ensure minimum waste generation. Wastes will be classified in accordance with the applicable regulations (recyclable, hazardous, inert, non-hazardous, etc.) and it will be ensured that wastes are collected, temporarily stored, transferred and disposed of within the framework of this system. As necessary, a temporary waste storage area will be designed and constructed in a specifically designated area in order to ensure that hazardous wastes are appropriately stored in the construction site. Records will be kept about the waste generation, storage and disposal. It will be ensured that wastes are disposed of in licensed facilities. Employees will be trained about waste management practices. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Construction and excavation wastes	<ul style="list-style-type: none"> Irrigation Modernization Project involves the replacement of existing open channels with pressurized closed channel system. In this scope, the wastes from existing system will be disposed of in accordance with Regulation on the Control of Excavation Material, Construction and Demolition Wastes OG no. 25406 dated 18 March 2004). 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents



Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	<ul style="list-style-type: none"> In cases where permanent storage of excavation wastes is necessary, these wastes will be stored in areas that will not harm the local people, flora and fauna species, in line with the opinion of the related authority in line with the Regulation on the Control of Excavation Material, Construction and Demolition Wastes OG no. 25406 dated 18 March 2004). Erosion control measures will be taken for areas where excavation materials and construction wastes are stored. Necessary measures will be taken to prevent silt flow and similar impacts on from the storage areas to surface waters. 			
Excavation works	<ul style="list-style-type: none"> Excavation works will be carried out only within the related area, and any damage on neighboring areas by excavation works will be avoided. Excavated earth and topsoil will be stored separately and their mixture with each other will be prevented. Excavated earth may need to be temporarily stored along the canal route for use in refill process later on. In this case, the contractor shall ensure that sufficient area is left along the construction route and make an arrangement for storage of excavated earth and topsoil. The area will be restored later, and the topsoil will be used for this purpose. Excess excavation material (including rocks and stones extracted during the excavation) will not be left on site after completion of construction works. All excavation works will be carried out in a controlled manner during rainy seasons. The channels involving underground pipes will be closed soon after the completion of works and approval of the related supervision engineer, and they will not be left open to environmental impacts for a long time. The channels excavated for placement of pipes will be protected from surface water that may come from the vicinity. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Noise	<ul style="list-style-type: none"> Construction activities will be carried out between 07:00 and 19:00 hours to the extent possible. The necessary permissions will be obtained and the local authorities and people will be informed beforehand if any work is necessary beyond these hours. Residents in close settlements will be informed throughout the construction process. Threshold values will be observed for continuous construction site noise (daytime - 70 dBA) (Regulation on the Evaluation and Management of Ambient Noise). In order to ensure this, work machinery will be periodically maintained and lubricated, and parts that may cause excessive noise will be replaced. Fixed construction machinery will be placed away from sensitive recipients such as schools, hospitals and residences. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents Weekly and monthly reports within the framework of monitoring schedule
Air Quality	<ul style="list-style-type: none"> The emission threshold for dust and particulate matters, which is 3 mg/Nm³ (Regulation on the Control of Air Pollution from Industrial Sources), will not be exceeded. For this purpose; <ul style="list-style-type: none"> Watering will be done during dry seasons. Filling and emptying processes will be done without scattering. Water sprinkling will be applied in order to prevent dust formation during the process. Furthermore, workers will be warned to be careful during the filling and emptying processes. The direction and speed of wind will be taken into account when loading and unloading materials. The top of trucks will be covered and a speed limit will be applied in order not to disturb the security of the local people and to prevent scattering. All the vehicles to be used must have exhaust emission permits 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents Weekly and monthly reports within the framework of monitoring schedule
Surface waters	<ul style="list-style-type: none"> All surface water resources within the project area will be protected from project-sourced wastes and activities and pollutants such as excavation materials to be temporarily or permanently stored. Surface water resources will not be used for washing and cleaning of vehicles to be used for construction works. In case the channels excavated for pressurized pipes are filled with surface water, ground water or rainwater, the potential muddy water to be discharged from these channels will not be discharged directly to receiving bodies. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents Weekly and monthly reports within the framework of monitoring schedule



Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
	<ul style="list-style-type: none"> The wastewaters to be generated from the toilets and bathrooms in the construction site will be discharged after being treated in accordance with the applicable regulations. 			
Traffic	<ul style="list-style-type: none"> Warning plates will be placed along the excavation route to ensure safety of people, and entrance to the construction site will be blocked using plastic stripes, barriers and luminous warning lights. Necessary measures will be taken through the related authorities in order to ensure a safe flow of traffic. Local people will be informed about the construction program. In case of any interruption or cessation of work during the construction stage, the trenches must not be left open and necessary measures must be taken. In order to prevent any interruption in the flow of traffic on roads used by local people, during the construction activities, an alternative road route will be determined. The roads to be used will avoid passing nearby sensitive recipients such as schools and residences, to the extent possible. The project area and environs will be equipped with safety and traffic warning signs. Speed limit rules will be complied with. The vehicle drivers and work machine operators to be employed during the construction will be informed about safe drive. Existing roads will not be damaged during the transportation activities. In case existing roads are damaged during the traffic of heavy vehicles, the cost of damage will be compensated and covered by the contractor. In the event of an environmental, occupational health and safety, or public health safety related accident in the project area, the contractor will immediately inform DSI about the accident, and DSI will inform the World Bank within 3 days. The detailed report on the accident (including root-cause analysis, post-accident measures taken after the accident and information on compensation) should be sent to DSI and to the World Bank within 30 days. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Labor health and safety	<ul style="list-style-type: none"> The employees will be provided with all types of protective equipment (helmet, safety belt, labor health costume, eyeglasses, gloves, safety boot, etc.). The employees will be trained about labor health and safety. All the employees will be informed about the safety rules, risks and applicable regulations required to be complied with during the construction activities. If channels deeper than 1.5 m. have to be excavated when laying the pressurized pipes, indoor area working procedures shall be applied. The Contractor will take required measures pursuant to the applicable regulations to protect and enhance labor health and regulate working standards in particular. The Contractor will comply with the principles of fair treatment and non-discrimination and create equal standards for all employees. In the event of an environmental or occupational health and safety, or public health safety related accident (eg. fatal or serious injury work accidents, environmental spills etc.) in the project area, the contractor will immediately inform DSI about the accident, and DSI will inform the World Bank within 3 days. The detailed report on the accident (including root-cause analysis, measures taken after the accident and information on compensation) will be send to DSI and to the World Bank within 30 days. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents



Cultural Heritage	<ul style="list-style-type: none">• Chance-find procedure will be created.• In case of a chance-find, all activities that may damage the archaeological find will be stopped and the related Museum Directorate will be contacted immediately.• If deemed necessary by museum officials, assistance will be provided to the formation of a research team under the Museum Archaeologist and mitigation measures required by the research team will be implemented.	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Land consolidation and land take.	<ul style="list-style-type: none">• Any loss of assets, or livelihood will be compensated through site specific LAPs• Consultations with all stakeholders including vulnerable groups will be realized in line with SEP to inform about the land consolidation/acquisition process	Included in the planning cost. No additional cost.	DSI Contractor	



Impact/Issue	Mitigation Measure	Cost (TL)	Institutional Responsibility	Comments
Infrastructure	<ul style="list-style-type: none"> Damages to existing infrastructure and superstructure (telecommunication lines, bridges, high-voltage lines, etc.) will be avoided to the extent possible. Any damages will be compensated in line with LAPs. 	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Labor	<ul style="list-style-type: none"> Civil work contracts will oblige the contractor to follow the national legal framework and ban the worst forms of child labor. 	No additional cost.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Post-Construction				
Temporary storage areas and camp sites	Temporary storage areas and campsites will be restored before operation, and no excess excavation materials, construction materials and debris must be left in the site. All temporary sites (with lease or rental agreement or with easement) that will be handed back to the owner will be reinstated to its original state before delivery.	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents
Borrow pits	Make sure all necessary permits have been obtained for the borrow pits to be used for construction activities.	No additional cost. Cost included in contract price.	Contractor Supervision responsibility with DSI site staff.	Tender and contract documents

Table 4. Monitoring Plan for Construction Stage

Subject	What are the parameters to be monitored?	Where will the parameters be monitored?	How will the parameters be monitored / what are the monitoring instruments?	When will the parameters be monitored? Measurement frequency / continuous measurement?	Why will the parameters be monitored?	Cost	Responsible institution*	Start date	End date
Construction Stage									
Dust-particulate matter (dust to originate from the movement and exhaust gas of construction machinery)	Dust to originate from the movement and exhaust gas of earth-moving and construction machinery (mg/Nm ³) Complaints from public	Construction Area, campsite, settlements closest to the permanent and temporary storage areas	Visual observations Interviews in nearby settlements Instantaneous measurements	Weekly / instantaneous measurements during excavation / intensive construction times Upon complaint / in accordance with the Regulation	Regulation on the Control of Air Pollution from Industrial Sources, Regulation on the Evaluation and Management of Air Quality WBG's General Environment, Health and Safety Manual	No additional cost (within project budget)	Contractor / DSI	Beginning of construction work	Completion of construction work
Noise	Complaints from public Noise level (dBA)	Construction Area, campsite, settlements closest to the permanent and temporary storage areas	Interviews in nearby settlements Level of noise to be measured by Noise meter (noise level meter)	Weekly / instantaneous measurements during excavation / intensive construction times Upon complaint / in accordance with the Regulation	Regulation on the Evaluation and Management of Ambient Noise WBG's General Environment, Health and Safety Manual	No additional cost (within project budget)	Contractor / DSI	Beginning of construction work	Completion of construction work
Wastewaters originating from campsites	Connection to sewerage system		Connection Permit	N/A	Lake Eğirdir Discharge Standards	No additional cost	Contractor /	Beginning of construction work	Completion of construction work



Subject	What are the parameters to be monitored?	Where will the parameters be monitored?	How will the parameters be monitored / what are the monitoring instruments?	When will the parameters be monitored? Measurement frequency / continuous measurement?	Why will the parameters be monitored?	Cost	Responsible institution*	Start date	End date
	In case use of a WWTP, COD, BOD, pH, SSM, E-coli, Total Coliform at the outlet In case use of septic tank, collection schedule and the WWTP utilized for final disposal	Sewerage connection Septic areas	Transfer and discharge documents	As mentioned in the discharge permit	Water Pollution Control Regulation WBG's General Environment, Health and Safety Manual	(within project budget)	DSI		
Surface waters	COD, BOD, pH, SSM, E-coli, Total Coliform, depending on the discharge to the receiving bodies, if wastewater treatment plant is established Turbidity due to the discharge of water accumulated in trenches due to rainfall and ground waters, to the receiving body	Receiving body, before and after discharge Receiving body, before and after discharge	Discharge permit, 24-hour composite sampling, laboratory analysis Visually, or using measurement device upon site upon complaint	At times mentioned in the discharge permit Instantaneous Upon complaint	Lake Eğirdir Discharge Standards Water Pollution Control Regulation WBG's General Environment, Health and Safety Manual	No additional cost (within project budget)	Contractor / DSI	Beginning of construction work	Completion of construction work
Excavation, solid and hazardous wastes originating from the construction sites	Permit certificate for excavation waste storage areas and temporary storage areas Excavation material and waste storage areas Certificates of transportation to acceptance to disposal facilities	Construction Area, Campsite, permanent and temporary storage areas	Visually	Weekly and monthly	Lake Eğirdir Conservation Plan and Special Provisions Waste Management Regulation, Regulation on Control of Soil Pollution and Areas Contaminated by Point Sources, Regulation on the Control of Excavation Material, Construction and Demolition Wastes and Regulation on Control of Waste Oils WBG's General Environment, Health and Safety Manual	Not high, although subject to the availability of a municipal and / or licensed recovery plant. Not high, although subject to the availability of a licensed recovery plant.	Contractor / DSI	Beginning of construction work	Completion of construction work
Wastes to originate from the vehicle park	Wastes oils, batteries, used tires and scrap vehicle materials	Vehicle park	Review and control of vehicle examination certificates	In case of breakdown / during periodic maintenance	Lake Eğirdir Conservation Plan and Special Provisions Regulations on Control of Waste Oils, Control of Waste Batteries and Accumulators, and Control of Used Tires WBG's General Environment, Health and Safety Manual	Not high, although subject to the availability of a licensed recovery plant	Contractor	Beginning of construction work	Completion of construction work
Health and safety	Documentation about the health and safety training Certificates of participation in training Safety equipment used by	Construction Site, Campsite, permanent and temporary storage areas	Visually	At the beginning of each work stage Daily	Lake Eğirdir Conservation Plan and Special Provisions Labor Health and Safety Regulation WBG's General Environment, Health and Safety Manual	No additional cost (within project budget)	Contractor / DSI	Beginning of construction work	Completion of construction work



Subject	What are the parameters to be monitored?	Where will the parameters be monitored?	How will the parameters be monitored / what are the monitoring instruments?	When will the parameters be monitored? Measurement frequency / continuous measurement?	Why will the parameters be monitored?	Cost	Responsible institution*	Start date	End date
	the workers in the construction site (helmet, gloves, shoes, safety belt, etc.)								
Public and Traffic Safety	Plastic stripes, barriers, warning plates Traffic flow / intensity Information of individuals and business owners living along the road route about the construction program	Construction Site, Campsite, permanent and temporary storage areas	Visually	Throughout construction stage	WBG's General Environment, Health and Safety Manual	No additional cost (within project budget)	Contractor / DSI	Beginning of construction work	Completion of construction work
Cultural and historical assets	New cultural assets that may be found in the project area	Construction site, campsite, permanent and temporary storage areas	Visually	When a cultural asset is encountered, it will be monitored by Cultural and Natural Wealth Conservation officials	Compliance with Cultural and Natural Wealth Conservation Law	Not high unless a cultural asset is damaged	Museum Directorate / Regional Protection Board DSI	Beginning of construction work	Completion of construction work
Land consolidation and land take	Information on individuals subject to land consolidation or land acquisition	Construction site Lands used permanently or temporarily within construction site	Site specific LAPs Site visits Interviews with project affected people Regular reports from site on LC and land acquisition	Land acquisition and land consolidation will be monitored on a daily basis by local DSI officials throughout their process Quarterly reporting will be realized for WB	Compliance with Bank's OP 4.12	Costs will be included in project budget	DSI	Prior to construction	Before construction begins
Post-Construction									
Restoration and rehabilitation of degraded areas	Restoration, construction wastes left on site, excavation materials, solid wastes and other unused materials and wastes	Construction site, campsite, permanent and temporary storage areas	Visually	After completion of construction works	Waste Management Regulation, Regulation on Control of Soil Pollution and Areas Contaminated by Point Sources	No additional cost (within project budget)	Contractor / DSI	Completion of construction work	Provisional acceptance

7 Roles and Responsibilities

The roles to be performed under ESMP and the parties responsible for these activities are shown in Table 5.

Table 5. Roles and Responsibilities

Responsible Party	Responsibilities
World Bank	<ul style="list-style-type: none"> • to review, approve and disclose ESMPs on WB's official website. • to review the scheme specific ESMPs and LAPs and provide no objections to DSI. • to provide assistance in the preparation of gender sensitization trainings to be given to DSI local staff and WUA representatives. • to conduct implementation support missions in order to ensure that the Project is in compliance with WB Safeguards Policies.
DSI	<ul style="list-style-type: none"> • to implement the ESMF • to prepare ESMPs • to submit ESMPs the WB for prior review. (after the prior review of a defined number of ESMPs, the procedure may shift to post review subject to the mutual agreement of the WB and DSI). • to perform the quality control and review of ESMPs. • to disclose ESMPs on the official website of DSI and incorporate ESMPs into bidding documents. • to appoint specialist for the environmental and social monitoring. • to perform inspections of the implementation of ESMP by the construction contractor, make recommendations and decide whether additional measures are needed or not. • in case of non-compliance, ensure that the contractor eliminates the noncompliance and inform the WB about the noncompliance. • to prepare, update and implement a Stakeholder Engagement Plan (SEP) that considers vulnerable groups in addition to paying attention to the gender aspect of the Project, • to hold consultation meetings, and prepare and distribute leaflets or other informative documents to inform communities, recruit a community liaison officer on project, and its impacts and construction schedule as well as rights and entitlements of PAPs • to create a local level grievance mechanism • to provide guidance to the construction contractor and engineering supervision firm. • to summarize the environmental and social issues related to project implementation to WB in regular progress reports. • to be open to comments from affected groups and local environmental authorities regarding environmental aspects of project implementation. Meet with these groups during site visits, as necessary.



Responsible Party	Responsibilities
	<ul style="list-style-type: none">• to coordinate and liaise with WB supervision missions regarding environmental and social safeguard aspects of project implementation.• to conduct regular monitoring activities for the implementation of site specific ESMPs and LAPs also including updates on land consolidation activities previously conducted by MoFAL• to prepare/design sensitization training and tools for DSI's local (regional and/or branch level) staff and WUA representatives
Contractor	<ul style="list-style-type: none">• to implement ESMPs on site, if required can revise the ESMP together with DSI.• to manage the grievance mechanism at the contractor, communicate grievances to DSI regularly through ESMP monitoring reports.• to monitor site activities on a regular basis (daily, weekly monthly etc.)• to prepare the ESMP progress reports for the review of DSI.• to compensate or fix damages occurred during construction (i.e. damages to crops, infrastructure) as set out by the ESMP or LAP/LAPF.
Environmental and Social Specialist (to be appointed by DSI)	<ul style="list-style-type: none">• to ensure that ESMP is implemented correctly and in a timely manner by the contractor.• to perform environmental and social monitoring as defined in ESMF and sub-project specific ESMPs.• to collect information on environmental and social issues for progress reports submitted to the WB and make sure that these are all compliant with the Bank's requirements.
Communication Specialist (to be appointed by DSI)	<ul style="list-style-type: none">• to prepare, implement and monitor the Communication Strategy of the Project.• to prepare all communication and visibility tools (i.e. brochures, leaflets, banners, posters, meeting announcements etc.) that will be used to inform host communities.• oversee the process for printing and dissemination of the communication/visibility tools as well as planning and organization of public events and consultation meetings with Project beneficiaries.• to prepare periodic reports on all communication and visibility activities realized under the Project to the DSI to be submitted to the Bank as a part of the monitoring process.

8 Public Consultation Meetings

A public consultation meeting was held in Atabey-Isparta on June 20, 2018 in order to introduce ESMF, LARPF and Atabey ESMP and receive the comments of people (Photos 1 and 2). The meeting was held with the participation of WUA members, irrigation employees, workers and local people where at a total of 120 participants with 6 women were present. The minutes of the meeting and the participant list is given in Annex 3 and 4. The attendees from DSİ's side included Regional Deputy Manager, Project and Civil Department Manager, Operation and Maintenance Department Manager, DSİ General Directorate Property and Expropriation Head of Department, Survey and Assessment Department Manager and Topographical Engineer, while Atabey WUA Chief and Manager have attended from WUAs side. DSİ together with WUA's presentation included information on the project in general as well as its advantages for the farmers, technical details of the project, financial sources and land acquisition and consolidation studies. It was also pointed out that all the works will be implemented in environmental friendly means. In addition, technical details of the site-specific work to be undertaken for Atabey were shared with participants. The attendees asked technical details on the land consolidation practices as well as their requests on acceleration of the consolidation activities.



Photo 1. Atabey DSİ Presentation



Photo 2. Atabey Public Consultation Meeting

9 Reporting

The reporting processes required to be carried out during the project implementation stage and the requirements for these processes are presented in Table 6.

Table 6. Requirements of Reporting Process and Distribution of Roles

Responsible Party	Requirement of Reporting Process
DSİ	<ul style="list-style-type: none">▪ Preparation and submission of the quarterly Project Information Notes (PIN) in a regular manner to the Bank in line with the Bank's time schedule▪ Preparation and submission of the Project Progress Reports (PPR) semiannually to the WB▪ Summarizing the environmental and social issues related to project implementation to WB in regular progress reports.▪ Preparation of Monitoring Reports to the WB every six months before WB task team site visits.
DSİ / DSİ Regional Directorates	<ul style="list-style-type: none">▪ Preparation of semi annual Monitoring Reports for prior review of the World Bank.
Contractor / Construction Supervision Consultants	<ul style="list-style-type: none">▪ Preparation of ESMP progress reports and their submission yto the DSİ for approval



ANNEXES

Annex- 1: Atabey Irrigation Area and Units

Annex- 2: Construction Schedule

Annex- 3: Minutes of Atabey Public Consultation Meeting

Mr. Göktağ İLTER, Deputy Regional Director of the 18th Region of DSİ, delivered the opening speech.

Mr. Mayor and distinguished guests, welcome to our consultation meeting. Atabey irrigation scheme has been operating as an open system for many years. We completed the project designs in 2017. It was already included in our investment program, but 5 projects were included in the World Bank's Irrigation Modernization Project from Turkey, and Atabey Irrigation Scheme is one of them. The objective of this public consultation meeting is to explain the project we want to implement and your expectations from the project.

First I will deliver a speech and then Mr. Mayor will speak, to be followed by a speech by Mr. Murat ÇINAR, our Operation and Maintenance Branch Director, who will inform you about on-farm implementation system and a speech by Mr. Ömer AÇIKGÖZ, our Project Construction Branch Director, who will provide information on project details. Mr. Hüseyin ERCAN, Branch Director at Property Expropriation Department of our Directorate General will provide information on the land and related Expropriation and Consolidation work, project results and evaluation meeting.

I would like to thank you all for coming to our meeting and invite Mr. Mayor to the floor to deliver his speech.

Distinguished representatives from the Directorate General, management staff of our Regional Directorate, dear fellow citizens, the rehabilitation project development studies have been underway since 2014. Implementation could not be started between 2006 and 2011 due to high costs and participation shares. After 2014, under the leadership of our Deputy Mr. Recep ÖZEL efforts have been made to convert this entire irrigation scheme to closed system, and initiatives taken by our Minister Prof. Dr. Veysel EROĞLU and Director General Mr. Murat ACU, who had earlier served as the Regional Director in Isparta, as well as our current Regional Director and other senior officials. On behalf of all our farmers, I would like to thank for the implementing this project finally.

The World Bank loan will be used for 5 projects. Under the first implementation, there was a 10 percent participation share for participation in the project. With the contributions of our Minister and Director General this participation share has been lifted and the project has been prepared. The 2,200 ha section for which the Ministry of Development did not provide approval was separated, and a 14,000 ha section was included in the scope of the World Bank

project. The tender for the project will be held in July with an average cost of 450 million TL. The project, which will be one of the first 5 projects, will ensure conversion to closed system, with water supplied from both the dam and Lake Eğirdir. We would like to thank our Director General and his senior staff and wish all the best.

Mr. Murat ÇINAR, Operation and Maintenance Branch Director, took the floor: Mr. Mayor and distinguished participants, welcome to our meeting. We will listen and respond to your expectations and requests in this meeting about Atabey Irrigation Scheme project introduction meeting. Atabey Irrigation Scheme was commissioned in 1974 and has been operating as an open system since then. Closed system was applied for trial purposes in a certain part of the scheme in 2005. Our Directorate General started studies to rehabilitate the old system in this irrigation scheme. We had a farmer participation share rate of 50 percent. We implemented the first system in Uluborlu Irrigation Scheme in Isparta. Then the rate of participation share was reduced to 20 percent and then to 10 percent. The project has been developed without participation share for a specific number of irrigation schemes. One of these projects is Atabey Irrigation Scheme. We are planning to implement it together with the World Bank without any participation share. So far, support has been provided for 5 projects in the first phase and Atabey is one of these projects. Omnibus Law No. 7139 has introduced certain amendments to Law No. 6172 including the elimination of participation shares. Furthermore, land consolidation will also continue. This task has also been transferred to State Hydraulic Works. Let me explain the amendment made to Law No. 6172. Through the Omnibus Law, the Association management has been liquidated and a public official has been appointed as the Chairman of Association. After the Law took effect, management handover took place at the Associations on May 28-29. Mr. Celal CEYLAN has been appointed as the Chairman of our Association.

Mr. Mayor, dear participants and distinguished fellow citizens of Atabey. My name is Ömer AÇIKGÖZ and I am Project Construction Branch Director at DSİ Isparta Regional Directorate. I will provide you with technical details about Atabey Irrigation Scheme project. As you see in my presentation, Atabey Irrigation Scheme was commissioned in 1974 and water is supplied from Lake Eğirdir. Through two Bedre Pumping Stations installed nearby the Lake, irrigation water is elevated by 44.50 meters and delivered to irrigation areas with 4+ 231 km long tunnels, 104 + 996 km long main canal, 447+985 km long secondary and tertiary canals. The water is pumped to various elevations using 5 pumping stations after the tunnel outlet.

Within Atabey Irrigation Scheme, Sav and Sevinçbey will be irrigated through gravity, with water conservation achieved through drip and sprinkle irrigation. This project area has been designed as 16,051 ha in total and 15,737 ha net. In addition to irrigation, Atabey Akçay Dam has been designed. In this scope, Atabey Akçay Dam Harmanören Pumps 1-3 and existing facilities will be rehabilitated and an area of 16,000 ha will continue to be irrigated. There

are the electricity costs of the pump of 8 facilities, which cause us the biggest trouble.. They consume approximately 10 million kWh of electricity annually. Although not finalized yet, negotiations continue between our Directorate General and the World Bank, we expect it to be concluded in 8 months. We have plans to install a solar power plant of 5 MW on a land of 100 da, to meet the electricity needs of the scheme.

Approximately 70 million m³ of water is abstracted from Lake Eğirdir. This will help us achieve a 40 percent saving. The solar power system will also help us save 10 percent energy. The money to be saved by the Irrigation Association will increase by 15 percent. The new system will have a metering system with card, and technical work is underway for this purpose. GIS documents are being prepared and we are sharing the positive aspects of the facility with our Directorate General. As will be explained by Mr. Hüseyin, the project will involve service roads and monitoring of air quality and environmental incidents. Our Directorate General conducting an R&D study, covering an area 40 – 80 da, including 10-15 parcels, with pipes of 200-300-500 meters to be laid. You used to lay and remove drip and sprinkle irrigation pipes, and we are developing an important project to eliminate this need. We will meters and card readers at the inlet of each parcel and we are now trying to receive assistance from software development firms. On the other hand, we will respect the environment during project implementation and will take necessary measures at every stage. That's all that I want to tell you about. Have a nice day..

Mr. Göktuğ İLTER, Deputy Regional Director, took the floor and said the following: The Irrigation Association pay an electricity bill of approximately 3,2 million TL for Atabey Irrigation Scheme and this is paid out of the pocket of users. Work is underway to reduce the the electricity bill of approximately 3,2 million TL, by installing a solar power system.

Mr. Mayor and dear participants, my name is Hüseyin ERCAN. I am a Branch Director at the Property and Expropriation Department. Today, I will provide you with information on the land consolidation and expropriation activities under Atabey Irrigation Scheme Rehabilitation Project. State Hydraulic Works has four main functions: Irrigation, Energy, Drinking Water and Flood Protection. In recent years, DSİ has been carrying out land consolidation first if the area is suitable for this, particularly for irrigation facilities. Our primary practice will be consolidation under Atabey Irrigation Scheme project. There may also be cases that require expropriation. DSİ will compensate for the damages and losses that may occur on the lands during the construction stage. We will be consulting with you throughout this process through information meetings at every stage. State Hydraulic Works will always be with you.

State Hydraulic Works has been carrying out its expropriation activities under Expropriation Law No. 2942 based on Article 46 of the Constitution. The referred law was amended in 2001 and is being updated further from time to time. The general practice is to proceed with expropriation through agreement first.

Expropriation process begins with the decision of public interest and ends with registration. After the decision of public interest is taken, expropriation plans are prepared, land registry records are extracted, address investigation is carried out, valuation is done for the properties and the right holders are invited to reconciliation negotiation. If an agreement can be reached with the right holders, expropriation fees are remitted to the accounts of owners after land registration process. If an agreement cannot be reached, then the case is referred to the court. the administration pays the court expenses. The values appraised as a result of lawsuit are paid to the owners, followed by the registration process

With regard to land consolidation, land surveys have to be conducted first. Of the area is suitable for consolidation, then a Council of Ministers decision has to be obtained. Council of Ministers decision serves as a decision for public interest. So this approval has to be obtained. Every action we take, which involves title to a property, requires a decision of public interest. A graduation is done based on the characteristics of the parcel and soil analyses. Every transaction step is subject to information and posting requirements. Subsequently, objections and requests are received if any. State Hydraulic Works officials interview with our farmers with a view to collecting their requests and demands, e.g. where they want their land to be allocated, which neighbors they want, etc. these are taken in writing and then we evaluate them. As a result of these activities, subdivision plans are completed and posted. We share every stage of this process with our citizens. The plans are posted at Municipalities, Headman's Offices, Irrigation Associations such that all citizens can see them. The registration and site handover are concluded after this process is completed.

This and other projects (5 projects) are subject to the basic principles adopted by the World Bank, in addition to the local legislation. With regard to land acquisition, land acquisition framework document will be prepared and published. Based on this framework document, land acquisition plans will be prepared for each project and procedures will be carried out in accordance with these plans. Throughout the project, our administration will collect your requests and demands at every single stage through a mechanism to be created in cooperation with the supervision organization, Irrigation Organization, line branches, Regional Directorate and General Directorate, and the process will be managed in broad consultation.

Atabey Mayor took the floor and said the following: In Atabey, with regard to land consolidation, Ministry of Agriculture has reached a certain level of progress and land and soil measurements have been completed. If we can speed this up, with the assistance of friends from State Hydraulic Works, it will be possible to finish it faster. Mr. Hüseyin responded that the consolidation practice would not cause any grievance on the part of citizens, but on the contrary land consolidation in this plain would reduce all types of expenses and costs and the consolidation of 4 or 5 parcels would allow for increasing savings and production. He also said that the citizens would not be exposed to any grievance with regard to fixed facilities on lands. The primary purpose of consolidation is integration. As regards irrigation, we are now

introducing on-farm systems where we will extend pipes to every 6-8 da. We have a main line of approximately 430 km. In an area with no consolidation, on-farm pipe length is 1,200 km, corresponding to a ratio of 1:3. This is increasing pipe cost. So what happens? This also brings about an additional tax burden. The purpose is to reduce costs and ensure easy access to the field of everyone. You cannot build roads everywhere. Consolidation requires a 10 percent deduction for expropriation right . Or, if we build a road for everyone, this would rise to 30 percent. There are 10 pieces of inherited lands, they are currently shared at the rate of ½. Once they are consolidated, will these ½ shares be separated in their own or in shared plots? If you cannot reach an agreement among the heirs, we cannot divide a land of 6 da into 6 equal parts, it must not be smaller than 5 da, and not smaller than 3 da in the case of greenhouses. Dry agricultural lands cannot be smaller than 20 da. With regard to Irrigated Agriculture, we have Atabey and Büyükgökçeli schemes left. We have appointed a new chairman for the irrigation association. This was the purpose of on-farm system, all these pipes will be laid underground. Approximate project cost is 400 million TL. We aim at completing it in 4-5 years. Our purpose is to reduce the cost of Atabey Irrigation, to irrigate lands with a lower cost and to convert the system to closed system.

Mr. Celal CEYLAN, new chairman of the association, took the floor and said the following: I have been an Operation Engineer for 28 years and I have been appointed as the chairman of the association by State Hydraulic Works pursuant to the Law. I would like to thank everyone who has made a contribution to this project since the outset. the implementation of this project will bring about significant returns. Given that currently there is a water loss of 40 percent and a high level of energy cost, rehabilitation will eliminate these losses.

The Chairman of Association went on to say the following: New appointments have been made pursuant to the Law. All farmers must feel comfortable, I, the Association Manager and all other staff members have the qualifications required to solve problems in irrigation and rehabilitation processes. We will always produce solutions on the ground. With regard to energy costs, we have discussed issues with banks and CK Electricity Company. We are making adjustments to address problems. As a result of rehabilitation, irrigation rates and the value of agricultural lands will increase significantly, consolidation will raise land quality and productivity, and all farmers will have easier access to water with increased income. The contribution of irrigation to national economy will increase with a good irrigation scheme. Greenhouse operation will be scaled up, a new crop pattern will come about, greater crops yield will be obtained from unit area and migration from rural to urban areas will be reversed. We will all be in the field during the project implementation. The commissioning of a project that would ease access to water will engage women and non-water users into production and this will bring along a socioeconomic comfort. I would also like to emphasize that such projects to be undertaken in the backyard of Antalya will help us meet all needs of this large



tourism region. So I would like to urge everyone to look after their lands and boost production.

There will not be any pressure problem in the irrigation area, and if there is still a low pressure problem, necessary discounts would be applied. I want to assure you that relevant arrangements will be introduced for this purpose. I would like to thank everyone who have made efforts for this project.

PARTICIPANTS

Deputy Regional Director	: Göktuğ İLTER
Project and Construction Branch Director	: Ömer AÇIKGÖZ
Operation and Maintenance Branch Director	: Murat ÇINAR
Chairman of Atabey Irrigation Association	: Celal CEYLAN
Manager of Atabey Irrigation Association	: Cihan KARGI
DSİ Directorate General – Department of Property and Expropriation	
Surveys and Evaluation Branch Director	: Hüseyin ERCAN
Survey Engineer	: Atakan SERT



T.C.
ORMAN VE SU İŞLERİ BAKANLIĞI
DSİ GENEL MÜDÜRLÜĞÜ / DSİ İŞLETME ve BAKIM DAİRESİ BAŞKANLIĞI
İRBÖLGE MÜDÜRLÜĞÜ / İŞLETME BAKIM ŞUBE MÜDÜRLÜĞÜ
ATABEY SULAMASI SULAMA BİRLİĞİ BAŞKANLIĞI
ATABEY SULAMASI YENİLEME PROJE TOPLANTISI KATILIMCI LİSTESİ

ADI SOYADI	MESLEĞİ	TELEFONU	KATILDIĞI BÖLGE/KÖY	İMZA
Ayşenur Galip	Ev Hanımı		İslanköy	
Raamun BAŞANAR	Emekli		Ç. S. Mah.	
Ali İsmail	Çiftçi		İslanköy	
H. İbrahim Gökova	Emekli		Ç. S. Mah.	
Mehmet Döğen	Çiftçi		51 H. Ören	
Hüseyin Afif Yılmaz	Çiftçi		52 H. Ören	
Hakan Avcı	Çiftçi		H. Ören	
Sabri TAŞKIN	S. S. Mah.		H. Ören	
İhsan Akdede	Çiftçi		İslanköy	
Mustafa ÇIKMEZ	Çiftçi		H. Ören	
Senol Suat	Emekli		41 Atabey	
Mustafa KAYA	Emekli		Atabey	
Mehmet Ayhan	Emekli		2 H. Ören	
Deniz DOĞAN	Çiftçi		Ç. S. Mah.	
İbrahim KOLCU	Çiftçi		Atabey	
Halit Uğur	Personel		60 D. Göksele	
Ahmet Ayhan	Personel		Kuleköyü	
Mehmet Kılıç	İşçi		Atabey	
İsmail BİÇER	İşçi		Atabey	
Mehmet GÜNEŞ	İşçi		AZADCI	
Ahmet GÜNEŞ	Emekli		ATABEY	
Mehmet DOKUMCU	Emekli		ATABEY	
Ahmet Seyit Taş	Emekli		292 ATABEY	
Mehmet ÇESUR	Memur		Büyükdereköyü	
Seyit Demir	Emekli		"	
Hayrettin SUGALAN	Memur		İSRAKIN Mah.	
Şehinç SUGALAN	İşçi		İSRAKIN Mah.	
İrfan Çiner	Emekli		Ali Köyü	



T.C.
ORMAN VE SU İŞLERİ BAKANLIĞI
DSİ GENEL MÜDÜRLÜĞÜ / DSİ İŞLETME VE BAKIM DAİRESİ BAŞKANLIĞI
İL BÖLGE MÜDÜRLÜĞÜ / İŞLETME BAKIM ŞUBE MÜDÜRLÜĞÜ
ATABEY SULAMASI SULAMA BİRLİĞİ BAŞKANLIĞI
ATABEY SULAMASI YENİLEME PROJESİ TOPLANTI KATILIMCI LİSTESİ

ADI SOYADI	MESLEĞİ	TELEFONU	KATILDIĞI BÖLGEKÖY	İMZA
Güngör GÜLER	Emekli		İsparta/Mezket	
Salahaddin Şahin Emekli			82 Pembeli	
İbrahim GÖREK	"		47 İsparta	
FATMA GÖREK	"		"	
İsmail KUZUL	"		Atabey	
İ. Yaşar SÖNMEZ	"		"	
Zehra Özcanerhan	Köşen		"	
H. Y. İmar SP21	Emekli		Atabey	
Hüseyin HİÇÇELİ	"		"	
Yahya GÜVEN	Emekli Asb		Atabey	
Mehmet BİLDİRCİN	Emekli Öğretmen		K. Gökçeli	
Abdullah Kesmeç	Sulama Görevli		B. Gökçeli	
M.A. KAYAÜZ	Sulama Görevli		B. Gökçeli	
Rahmi ÖZTÜRK	Sulama Görevli		B. Gökçeli	
Sıtkı AKIN	Sulama Görevli		B. Gökçeli	
Kamil ÖZGÜNAY	Gözetmen		B. Gökçeli	
Adnan Kocaoglu	Sulama Görevli		Kuleönü	
Doğru Hakan KULCİ	İşletme Görevli		Kuleönü	
Mehmet ÖZDEMİR	Sulama Görevli		Kuleönü	
İsmail ŞİHMAN	SULAMA Görevli		Kuleönü	
Emir TOKLUK	Muhasebeci		Atabey	
AKİ GEYİK	Emekli		İsparta	
Abdullah ÖZGENİ	Sulama		Kuleönü	
Aliye Çobanoğlu	"		"	
Ahmet DENEÇİ	"		Kuleönü	
Hüseyin TOKER	Emekli		Atabey	
Mustafa TOKER	İşçi		İslan Köyü	
Recep KUTLUHAN	Emekli		İsparta/Mezket	
Hüseyin GÜL	İşçi		Atabey	
Fatih YALUMLU	İşçi		İslan Köyü	
Ali KESEN	İşçi		İslan Köyü	
Ali AKSOY	İşçi		İslan Köyü	
Ziya ÇİĞDEMİR	Emekli		Atabey	
Abdullah İLİZ	İşçi		Pembeköy	
Murat EKİNCİ	İşçi		İsparta/Mezket	
Ali CEMAL KARAGÖZ	İşçi		İslan Köyü	
Mehmet PEKTAŞ	İşçi		İslan Köyü	
Ali ÖSMAN SARI	İşçi		Gönen	



Annex- 5: Grievance Form/ Grievance Closeout Form

GRIEVANCE FORM			
Name of Person receiving grievance:		Date:	
Title:			
INFORMATION ABOUT COMPLAINANT		Ways of Receiving Grievance	
Name – Surname		Phone	<input type="checkbox"/>
Phone number		Meetings	<input type="checkbox"/>
Address		Application to Office	<input type="checkbox"/>
Village		Mail/email	<input type="checkbox"/>
Signature of Complainant (if possible)		Field visit	<input type="checkbox"/>
		Other:	<input type="checkbox"/>
DETAILS OF GRIEVANCE			



GRIEVANCE CLOSEOUT FORM		
ASSESSMENT OF THE GRIEVANCE	Expropriation	<input type="checkbox"/>
	Damages to households or livelihoods	<input type="checkbox"/>
	Environmental and social	<input type="checkbox"/>
	Employment	<input type="checkbox"/>
	Other	<input type="checkbox"/>
Compensation Required:	<input type="checkbox"/> YES	<input type="checkbox"/> NO
RESULT		
CLOSEOUT		
<i>This part will be filled in and signed by the complainant and the complaint evaluation committee when the compensation or file is closed-out. (Instead of taking the signature of the complainant, bank receipt or other documents can be attached with the form)</i>		
Responsible Person	Complainant	
Name-Surname	Name-Surname	
Date and Signature	Date and Signature (If possible)	