Executive Summary

Environmental and Social Management Framework for the Turkey Geothermal Development Project

disclosed by

TURKISH DEVELOPMENT BANK (TKB)

TURKEY

GEOTHERMAL DEVELOPMENT PROJECT (P151739)

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

EXECUTIVE SUMMARY

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1. INTRODUCTION

The Government of Turkey has set a target of developing 1,000 MW of geothermal electricity generation capacity by 2023 and has put in place a supportive legal framework to facilitate geothermal development. In this context, Government is committed to support the private sector to further scale up geothermal development and aims to do so by creating a mechanism to share the resource risk associated to the validation of geothermal resources and to facilitate financing for the resource development and construction phases of geothermal project development. The Geothermal Development Project (GDP) has been conceived to support the Government create and implement those mechanisms.

The primary objective of the GDP is to scale up private sector investment in geothermal energy development in Turkey. This will be achieved (i) by reducing the risks taken on by the private sector in the exploratory phases, and (ii) by providing access to long-term financing for the resource development phases. The project consists of two components:

(1) Risk Sharing Mechanism for Resource Validation (RSM) (USD 40 million, financed by the Clean Technology Fund) aims to promote private sector development of geothermal energy projects in the early stage exploratory and confirmation drilling stages by sharing the risk of failing to validate a geothermal resource among two parties: the administrator of a Risk Sharing Mechanism (RSM), capitalized by a CTF grant, and the geothermal developer (i.e. the Beneficiary). In case a well fails to yield outputs at a pre-agreed level between the RSM and the Beneficiary, the RSM will cover a pre-defined percentage of the drilling expenditures incurred by the license holder. The General Directorate of Renewable Energy (GDRE) of the Ministry of Energy and Natural Resources (MENR) will be the implementing agency for the RSM. This component will also finance technical assistance activities in order to address relevant capacity building needs within GDRE.

(2) Loan Facility for Resource Development (USD 316 million total; USD 250 million IBRD loan, USD 66 million TSKB/TKB co-financing), aims to address the financing gap that license holders face today in the resource development stages of geothermal project development by providing debt financing to encourage and support both license holders and financiers investing in (i) the capacity/production drilling stage and (ii) the steam gathering and power plant construction stage. This component will capitalize a credit line to the Industrial Development Bank of Turkey (TSKB)/Development Bank of Turkey (TKB), who on-lend at market rates, but offer longer tenors than currently available in the market, to geothermal developers at the capacity drilling, and to a secondary extent, at the construction stage.

The Loan Facility will be open to any geothermal development that has reached the capacity drilling stage, regardless of whether it benefited or not from the Risk Sharing Mechanism under Component 1.

2. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

As detailed in the component definitions, the project will be implemented by 3 financial intermediaries (DGRE, TSKB and TKB), therefore the category of the GDP is determined as “FI” with Category A and B sub-projects. Since the sub-projects are not clear during project preparation stage, an Environmental and Social Management Framework (ESMF) was prepared by FIs, which sets a technical guidance in organizing and handling environmental and social assessment and management for projects whose specific location and characteristics (e.g. dimensions, design) are yet to be defined. The ESMF presents the necessary compliance requirements for prospective investments to achieve approval of national laws as well as the provisions of the World Bank safeguard policies. In addition, the FIs also prepared and disclosed Resettlement Policy Frameworks

(RPFs) to define the process and procedures related to land acquisition aspects of Component 1 and 2 of the GDP. The draft ESMFs and RPFs were disclosed on all FI's websites and Bank's Infoshop in October 2015[1]. This Executive Summary is prepared to provide concise information about ESMF and RPF.

2.1. DESCRIPTION OF POTENTIAL IMPACTS AND SUGGESTED MITIGATION MEASURES

The environmental and social impacts related to exploration, capacity drilling (resource development) and operation phases of geothermal operation can be summarized as follows:

Exploration Phase: Drilling is the most effective methods in geothermal exploration. Slim and shallower holes as compared to production wells are often drilled, in many cases not deeper than 1,000 m. However, medium-size or full-size exploration wells are also often drilled as exploration and confirmation wells, which can later be used as production or reinjection wells. Temperature gradients and other geothermal characteristics are measured to provide information for determining and estimating the geothermal potential. Prior to drilling, surface exploration activities such as resistivity and seismic measures are carried out in order to produce a first conceptual model of the geothermal reservoir and locate the most appropriate targets for exploratory drilling. Impacts from surface exploration activities are expected to be minimal or non-existent. Potential impacts from exploratory drilling activities will be similar to those of production/capacity drilling and are discussed below.

Resource Development and Power Plant Development Phase: The main components of a geothermal power project are production wells, reinjection (or recharge) wells, brine and condensate pipelines, pumping station(s), and the power plant. There will be also new access roads and land clearing as necessary to facilitate development. Opening production and reinjection wells requires deep drilling. Most potential environmental and social impacts of geothermal development are associated to the resource and power plant development phases.

A more detailed information about environmental and social impacts of exploration, capacity drilling and geothermal energy production phases are presented below:

a) Fluids involved in geothermal drilling and production

Effluents of geothermal development projects can be classified as i) drilling fluids; ii) spent geothermal fluids; iii) reject water from injection wells; iv) well cleaning water (for clogging); and v) domestic wastewater.

i. *Drilling Fluids:* Freshwater is commonly used as a drilling fluid (circulation water) during drilling in the production zone of the reservoir. The purpose of the drilling fluid is to cool and lubricate the drilling equipment and carry rock cuttings out of the well. In some cases synthetic drilling polymers are injected to form high-viscosity polymer slugs (xanthan gum, starch, cellulose) to facilitate clean-out. Geothermal water extracted during well testing period is also considered as a drilling fluid.
ii. *Spent Geothermal Fluids:* These effluents consist of water from steam separators and condensate derived from spent steam condensation following power generation.

[1] The draft ESMF documents have been disclosed on clients' websites on October 5, 2015 (TSKB); October 15, 2015 (GDRE); October 19, 2015 (TKB) and on Bank's Infoshop on October 12 (TSKB) and October 20, 2015 (GDRE and TKB). The draft RPF documents have been disclosed on clients' websites on October 5, 2015 (TSKB); October 15, 2015 (GDRE); October 19, 2015 (TKB) and on Bank's Infoshop on October 12 (TSKB) and October 20, 2015 (GDRE and TKB).

iii. *Reject Water from Injection Well:* These effluents are produced during reinjection of geothermal water. This is a small amount, which is rejected by the geothermal source due to pressure.

iv. *Cleaning Water:* During the operation of wells, periodical cleaning is sometimes done using chemicals including strong acids, most commonly hydrochloric acid. The acids dissolve and remove mineral deposits from the wells and the surroundings. Before wells are subjected to acid treatment, it needs to be ensured that the well casings are leak proof to prevent any leakage of the acids to shallow groundwater aquifers. The acids are partially neutralized by dissolving the deposited minerals and then diluted through post-injection of fresh water or geothermal brine and finally by mixing with geothermal fluids in the reservoir before discharge.

v. *Domestic Wastewater:* These effluents are produced as a result of daily activities of workers during surface exploration, drilling and operation of a geothermal project.

Reinjection of drilling fluids is the target mitigation for disposal of geothermal fluids. However, Reinjection may not be possible during initial well testing phase. In that respect, the drilling fluids are stored in a storage tank/sump/pond lined with an impervious membrane before discharge to a receiving body in accordance to related regulations and standards. Depending on chemical characteristics of the drilling fluid, treatment may required before discharge.

b) Drilling Mud

Drilling mud typically consists of water mixed with bentonite (a natural clay). Additives are used to control the viscosity and density of the mud.

Transfer, treatment and disposal of mud in accordance to related regulations and standard is general mitigation for the mud removal. Disposal method is directly related to chemical characteristics of the mud.

c) Groundwater

Potential impacts on groundwater during the different phases of a geothermal project can range from low to high. Survey activities would typically have little or no impact on groundwater. If geothermal drilling is carried out according to best practices regarding use of drilling fluids and well casing there is very unlikely that geothermal water can contaminate ground water aquifers. However, casing failures in either production or reinjection wells may create pathways for geothermal fluids to mix with groundwater at shallow levels. Extracting geothermal fluids could also cause drawdowns in connected aquifers, potentially affecting flow from geothermal springs. This impact can be reduced through extensive aquifer testing and proper geothermal development planning. Monitoring wells should also be opened to monitor water levels. In terms of the quantity of resource, cumulative impacts that are caused by multiple producers (i.e. sponsors) using the same reservoir are important, and should be taken into consideration when there are two or more geothermal projects in same geothermal reservoir.

Proper well casing and well casing material selection for groundwater aquifer section(s) is the key mitigation for prevention of groundwater contamination. Monitoring of groundwater quality is also essential for high risk areas.

d) Surface water sources

Impacts on water resources during the different stages of project development would range from low to high. Surface exploration activities would have little or no impact on surface water. Temporary impacts on surface water may also occur as a result of the release of geothermal fluids during well testing, if they are not contained. Geothermal fluids are hot and often highly mineralized and, if released to surface water, could cause thermal changes and changes in water quality. Accidental spills of geothermal fluids could occur due to well blowouts during drilling, leaks in piping or

wellheads, or overflow from sump pits. Surface and groundwater quality may also be adversely affected due to direct discharge of wastewater.

In addition to reinjection of geo thermal fluids, treatment or connection to municipal network are the general mitigation measures for wastewater discharges.

e) Solid Waste

Geothermal drilling and operations do not generate substantial amounts of solid waste. Apart from drilling mud, other wastes produced by drilling include used oil and filters, spilled fuel, spent and unused solvents, scrap metal, pipe dope, etc. Domestic solid waste, packaging waste, non-hazardous wastes (e.g. paper, plastic and glass) can be generated as well. These type of solid wastes should be classified, separately stored and disposed in accordance to pertinent regulations

f) Noise

Primary sources of noise associated with exploration and drilling wells include drill rig operations, seismic surveys, blasting, earth-moving equipment (related to road, well pad, and sump pit construction), and vehicle traffic.

Use of appropriate construction methods & equipment is one of the mitigation to minimization of noise. Arrangement of working times, restriction of traffic in residential areas and careful siting and/or design of plant as well as providing noise barriers are other mitigation measures for prevention of noise.

g) Air emissions

Presence and concentration of potential air pollutants varies depending on the characteristics of the geothermal resource. Some of the toxic air pollutants such as hydrogen sulfide and mercury can be contained in geothermal fluids. Besides these chemicals, geothermal fluids can also contain environmentally sensitive gases such as carbon dioxide and methane. Mainly release of these gases can lead to occupational health and safety problems, especially in confined spaces within power plants and well head cellars and during initial discharge. However, depending on the chemical characteristics of geothermal resource, release of these gases can lead major air emissions and corresponding impacts. Greenhouse gas (GHG) emission from geothermal projects is commonly smaller as compared to fossil fuel combustion sources. Some geothermal fields can, however, have high GHG emissions as a result of specific geological conditions. Air emissions can occur during well drilling and flow testing activities. Well-field and plant-site vent mufflers can also be potential sources of hydrogen sulfide emissions, primarily during upset operating conditions when venting is required.

The use of closed system is the main mitigation for minimization of the air emissions. However, depending on the characteristics of geothermal source closed system may not be possible. An effective monitoring system supported with a proper safety planning and measures for uncontrolled gas releases should be established.

h) Well blowouts and pipeline ruptures

Although not common, well blowouts can occur during the drilling and operation stages of a geothermal project. These accidents can cause release of toxic fluids containing chemicals and heavy metals, and gases (i.e. hydrogen sulfide). Pipeline ruptures can also occur during drilling and operation. Such failures may also result in precipitation of minerals (silica and calcium carbonate) and release of geothermal liquid and steam containing heavy metals, acids, and other pollutants into the surface environment. In that respect, an emergency response plan for well blowout including measures for containment of geothermal fluid spills should be prepared.

i) Natural resources and natural habitats

In general, impacts on ecological resources can be low to moderate and localized during exploration, drilling and plant operations. Activities such as site clearing and grading, road construction, well drilling, ancillary facility construction, and vehicle traffic have the potential to affect ecological resources by disturbing habitat, increasing erosion and runoff, and creating noise at the project site. Depending on the project location, natural habitats may be important concern in terms of project impacts and a major constraint for site selection.

In order to minimize the impact natural habitats, careful siting, alignment, design of rig sites, and/or timing of works (seasonal) are considered.

j) Land use

In general, impacts on land use due to geothermal activities are temporary and localized. The magnitude and extent of impacts from constructing access roads would depend on the current land use in the area. All other uses of land under well pads would be precluded as long as they are in operation. Surface exploration activities are unlikely to affect mining, energy development activities or livestock grazing on surrounding lands. Land clearance and stripping may result in loss of vegetation and topsoil. Hence, good management practices should be implemented in order to minimize such impacts, and reinstatement should be made where necessary.

k) Well abandonment

At the end of operation of a well or if a well fails to provide thermal groundwater, well should be closed with concrete. This will protect other aquifers and living things from adverse impacts of hazardous gases and other hazardous substances that may originate from well.

l) Cultural resources

Geothermal development activities may cause impact on physical cultural resources known to be of local, regional or national significance based on proposed national or provincial lists identified during public consultation with local affected groups.

m) Expropriation

From social point of view, development of geothermal resources may involve occupation of large areas depending on the scale of project (i.e. number of wells, length of pipelines, and size of power plant and separator stations). Hence, a land acquisition process is implemented. Where the project area is not government property, expropriation is required, which may be among the major impacts associated with geothermal development, similar to the case in other energy generation investments.

n) Other social impacts

The construction period may create impacts on the current infrastructure such as roads and irrigation. Also, access to public services may be limited in case road infrastructure is damaged especially during construction of pipelines. There may be also population influx to project area and creation of new job opportunities and increase in local economic livelihoods. On the other hand, increase in local economy may also trigger a rise for local prices (i.e. house rental price) which can be a negative impact on local people. Positive aspects of geothermal development projects may be enhanced by providing some services to nearby communities. These services may include providing heating to the nearest settlements and/or industries or farms. This may be advantageous in terms of project costs if it results in removal of condenser from project formulation. The sub-project environmental and social assessment documents will include positive and potential negative impacts related to project development.

o) Occupational Health and Safety

Major health and safety issues in geothermal projects comprise the potential for exposure to i) geothermal gases; ii) gas accumulation and exposure to gas in confined spaces; iii) heat; and iv) noise. In addition, the use of acids for well cleaning should be conducted by taking all precautionary measures and by using protective equipment. Storage of these substances at the site should be done according to hazardous waste control regulation.

p) Community Health and Safety

Major community health and safety issues in geothermal projects include i) exposure to geothermal gases; ii) facility safety; and iii) impacts on water resources

Fencing around well sites, open ponds and mud pits are required in order to minimize the public access to risky areas. Siting of potential significant emissions sources with consideration of hydrogen sulfide gas exposure to nearby communities (considering key environmental factors such as proximity, morphology and prevailing wind directions) is another important mitigation to reduce the community health and safety risk. An emergency and response plan involving community input to allow for effective response to monitoring system warnings is also essential.

It should be noted that details about mitigation measures and monitoring requirements corresponding to the potential impact are provided in the ESMF document. As detailed in the ESMF, each project will be screened and reviewed on case by case basis. The environmental and social assessment documents (ESIA – for Category As, partial ESIAs or ESMPs for Category Bs) prepared for the projects will be reviewed by FIs. During review the evaluated environmental and social impacts of a project together with committed mitigation and monitoring measures will ve evaluated. World Bank will conduct prior review and post review process, the details are provided in the 'Implementation Arrangements' section below.

2.2. IMPLEMENTATION ARRANGEMENTS

The ESMF provides detailed information about the Environmental Impact Assessment (EIA) process of Turkish regulations, defines the requirements as per World Bank safeguard Policies and also provides guidance about meeting both requirements during project screening, assessment, compliance supervision and reporting. The ESMF states that each sub-project will be screened by the respective FI about its environmental category and an environmental assessment document (ESIA for category As, Partial ESIAs/ESMPs for Category Bs) will be prepared by the sub-project sponsor. Information on scope of these documents together with templates are also provided in the ESMF document.

ESMF also defines the roles and responsibilities of each party implementing the GDP. According to ESMF, the key actors in the implementation of this framework are the PIUs of Component 1 and 2 and the project sponsors. For Component 1, exploration, the PIU will be established in the General Directorate of Renewable Energy (DGRE). Since the first component also will include a risk sharing mechanism (RSM), it was decided that the mechanism would be managed by a consultant. This consultant from now on will be named as RSM consultant. It is planned that the RSM consultant will be also responsible for reviewing the exploration applications from the project sponsors in line with national and WB requirements as defined in this ESMF DGRE will be the final responsible party for the WB since they will be supervising the RSM consultant.

For Component 2, TSKB/TKB will be the financial intermediary for the implementation of the loan. The PIU in the TSKB/TKB will be responsible for implementation of this ESMF for the capacity drilling and power plant establishment and operation activities. In the following the overall roles and capacities of these actors are discussed.

PIU (DGRE and TSKB/TKB)

PIU will continue to include an environmental specialist to coordinate the implementation of the Environmental and Social Framework. The Environmental and Social Specialists' responsibilities will be as follows:

- Provide sponsor environment and social assessment (ESA) consultants guidance on preparation of EA documents in accordance with WB requirements – via RSM consultant for Component 1/Component 2.
- Provide sponsor ESA consultants with guidance on World Bank's environmental and social assessment procedures, notably consultation and disclosure requirements– via RSM consultant for Component 1/ Component 2.
- Provide sponsor ESA consultants with guidance on WB safeguard requirements (documentation and procedures) for cultural properties and natural habitats – via RSM consultant for Component 1/ Component 2.
- Review ESA documentation, provide written comments to sponsor EA consultants, ultimately provide formal approval of ESA documentation and procedures in accordance with WB safeguard requirements – via RSM consultant for Component 1/ Component 2.
- Ensure that sub-loan documentation includes agreements to implement the ESMP and any other environment or social safeguard requirements – via RSM consultant for Component 1/ Component 2.
- Perform supervision of ESMP implementation by the sponsor and document performance, recommendations and any further actions required as part of overall project supervision reporting to the WB – via RSM consultant for Component 1/ Component 2.
- 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 – via RSM consultant for Component 1/ Component 2.
- Coordinate and liaise with WB supervision missions regarding environmental safeguard aspects of project implementation

Sub-Project Sponsors

The ESA work to be prepared by the sponsors will be mainly conducted by consulting companies. Sponsors generally have the capacity to properly implement ESA documents during the construction and operational phases. Where such capacity is lacking, the sponsors will retain environmental specialist consultants to assist them in supervising the works carried out by the contractor and ensuring that the ESA document (ESIA, ESMP or Partial ESIA) is followed adequately.

In addition to the above-mentioned roles, it is expected that the PIU of component 1 and PIU of the second component (TSKB/TKB) will report to WB about the compliance status of the project activities with regards to respective EA documents. In its biannual project status reports, the PIUs will include a section titled "Environmental and Social Safeguards" which will summarize the status of ESA document's implementation based on its monitoring activities. The report will highlight any issues arising from non-compliance and how it has been/is being addressed during the implementation of the project. The capacity of the sub-project sponsors and their respective ESA consultants will be assessed via the continuous supervision of FIs and prior and post reviews of the WB.

World Bank

The World Bank will review and provide no objection to all projects required by Turkish regulation to prepare an EIA and/or assigned "Category A" in accordance with WB procedures before a final decision to fund the subproject can be taken by FI (mainly TSKB/TKB since some Category A's may be expected under Component 2 only). In case of Category B subprojects, first 2 sub-project will be submitted to World Bank for review and clearance. Assuming the ESMF is being implemented by the FI satisfactorily; the next Cat B sub-projects will be reviewed and cleared by the FI. World Bank will conduct post-review for the Cat B sub-projects. It should be noted that for all sub-projects, FIs will consult WB for proper environmental risk categorization according to OP 4.01.

2.3. SUMMARY OF LAND ACQUISITION

It is anticipated that the Project will have potential social impacts through its land acquisition requirements. Since specific investments under this Project were not known at the time of Project appraisal, RPFs have been prepared by the borrowers. With respect to the two Project components; the Directorate General of Renewable Energy (DGRE) for component 1, TSKB and TKB, the two financial intermediaries (FIs) for component 2 have prepared Resettlement Policy Frameworks (RPFs) to be followed for potential land acquisition related impacts of the Project. These last two RPFs provide a framework for the work to be done under the second component, namely Resource Development and Power Plant Development Phase. The RPFs describe anticipated project impacts, the legal framework for land acquisition and resettlement, types of project-affected persons, entitlements and compensation, and the steps that the borrower (and sub-project borrowers) will take to ensure compliance with the Operational Policy 4.12. These framework documents also apply retroactively to land acquisition that might have occurred before the sub-borrower applied to the PIU for World Bank financing. In such circumstances, an ex-post social audit will be required to assess conformity with framework principles and requirements and to preclude social risk, and mitigation measures.

All sub projects will be subject to the relevant Turkish legislation (Expropriation Law No. 2942, Resettlement Law No. 5543 etc.) and World Bank OP 4.12. In cases where there are gaps between the legal regimes, measures will be taken to meet the standards set in OP 4.12. The project sponsors of sub projects will be requested to prepare a RAP (that may also include a social audit of past land acquisition in anticipation of project) in accordance with the RPF and OP 4.12.

The footprint of a geothermal power plant will require acquisition of land for the power plant itself, multiple wells, the network of interconnecting pipe work, a transformer station, electricity transmission lines to connect to the grid, access roads and administrative offices. Expropriated well areas may leave land owners with land that is not viable for farming activities thus affecting their livelihoods. Similarly, the lattice of interconnecting pipes that installed above ground can have a more significant impact compared to just the base area for land acquisition due to dividing farmers' plots and cutting off access for people, animals and machinery. In these cases, the project sponsors will need to expropriate the entire land or take other mitigation measures. People affected from geothermal power plants will include land owners, absentee land owners, renters, sharecroppers, squatters and other users of land. Acquisition of houses and relocation is not anticipated, though should it be required, affected persons can include structure owners, asset owners, home owners, and renters. There might also be affected business and anyone who works in these businesses that is not covered by the above affected categories will be taken into consideration.

Project Affected Persons (PAPs) entitled to compensation and rehabilitation measures/resettlement are categorized as follows;

i) Loss of land or structures
ii) Loss of crops or economic trees
iii) Loss of rental land
iv) Illegal users of land
v) Loss of livelihood

The methods used for the valuation of assets will take place according national legislation. The project sponsor will make utmost effort to acquire land through negotiations. The negotiated sale price should be at the level of replacement cost at the minimum, and people will be made aware of their right to refuse. Where negotiations fail, the Article 10 of the Law No. 2942 will prevail. Shall the sponsor require to confiscate the land earlier than the normal expropriation process it shall apply Article 27 of the Expropriation Law (Urgent expropriation).). If Urgent Expropriation Law is applied, sufficient and meaningful notice will be provided to land owners through individual communication or consultation before land is acquired. This process does not prevent challenges of the property owners against the determined valuation.

In order to ensure that valuation of assets is in compliance with OP 4.12, in addition to the Turkish legal requirements, PIUs will follow the Entitlement Matrixes given in the RPFs which provide details to the entitlements for each type of loss endured by PAPs.

It is expected that majority of the sub projects will have already completed land acquisition works prior to applying to the loan. In such cases, an ex-post screening will be required for compliance of OP 4.12. PIUs will supervise their project sponsors to conduct a social audit for the approval of the Bank for No Objection.

Upon completion of payment of compensation for land acquisition to affected parties, the sponsor will prepare a land acquisition monitoring report as part of the supervision cycle, which will include the affected parties, lands taken, effects on livelihoods, the amounts and dates of compensation and completion date of land acquisition. Any unresolved compensation issues or expropriation cases taken to the courts will be noted in this report, which will be submitted to the World Bank in advance of commencement of civil works.

The sponsor will conduct and document consultation with affected communities prior to construction. Consultations will provide information about the Project and its components, as well as the start date and duration; inform PAPs of salient impacts, land acquisition process and compensation, resettlement (if any), income restoration arrangements and other project benefits. The consultations will also inform relevant stakeholders and PAPs of the Project's grievance redress mechanism.

The sponsor will be requested to establish a contact point and designate an accessible contact person that can help with the resolution of project-related concerns or issues, including those related to land acquisition and resettlement or impacts on land and property during construction. The sponsor will provide free telephones and keep a grievance redress logbook at the project site and document grievances and how these were resolved. Grievance redress mechanism will operate in line with WB policy requirements. A database for all kind of received grievances will be logged and kept by the sponsor.

PIUs will be required to submit to the Bank, a sub-project-specific monitoring plan to track impacts. They will also develop a Land Acquisition Monitoring Plan and during implementation, and submit six-monthly monitoring reports showing the status of land acquisition and resettlement activities, status of compensation paid, issues faced, and mitigation measures implemented, public meetings

held, livelihood restoration plans and programs started if any, types of grievances registered in grievance documentation and percentage of grievances resolved etc.

3. ENVIRONMENTAL AND SOCIAL MONITORING AND GRIEVANCE MECHANISM

Environmental and Social Monitoring

The environmental and social issues included within the mitigation measures are monitored and supervised by the appointed specialists through the FI of the project. Although the environmental and social impacts are expected to be quite low, the potential negative environmental impacts are planned to be prevented or mitigated during the construction and operation stages.

The Environmental Monitoring System will cover the following,

- General Environment
- Air Emissions
- Soil
- Surface water and groundwater
- Biodiversity
- Noise and dust emissions
- Worker Health and Safety
- Public Safety
- Social Monitoring

Environmental and social monitoring system starts from the implementation phase of the project thorough the operation phase in order to prevent negative impacts of the project and observe the effectiveness of mitigation measures. This system enables the WB and the borrower to evaluate the success of mitigation as part of project supervision, and allows to take an action when needed.

The monitoring system provides,

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

Grievance Mechanism

The Grievance Mechanism is a process that enables any stakeholder to make a complaint or a suggestion about the way a project is being planned, constructed or implemented. The sponsor will establish a transparent and comprehensive Grievance Mechanism before the implementation of the project in order to receive and resolve the affected communities concerns, queries, complaints and grievances about the environmental and social aspects of the project. Public announcements for the establishment of Grievance Mechanism includes,

- Distribution of leaflets to the public places
- Notice Boards
- Website
- Telecommunication Tools
- Public Meetings

The Grievance Mechanism (sometimes also called Grievance Procedure) will be prepared according to existing EIA and WB policies, procedures, laws and regulations. Detailed procedures for the

Grievance Mechanism is provided in the Resettlement Policy Framework document prepared for the project, which was disclosed publicly.