REPORT

Kvesheti-Kobi road project

Non-Technical Summary

Submitted to:

European Bank for Reconstruction and Development

Submitted by:

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ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
C&C	Cut and Cover
EBRD	European Bank for Reconstruction and Development
ECoW	Ecological Clerk of Works
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GEL	Georgian Lari
IFC	International Finance Corporation
IUCN	International Union for the Conservation of Nature
LARP	Land Acquisition and Resettlement Plan
m asl	Meters Above Sea Level
MoEPA	Ministry of Environment Protection and Agriculture
NGO	Non-Governmental Organization
NTS	Non-Technical Summary
RD	Road Department
RoW	Right of Way
S-EMP	Specific Environmental Management Plans
SEP	Stakeholder Engagement Plan
TBM	Tunnel Boring Machine

1.0 INTRODUCTION

The present Non-Technical Summary (NTS) is part of the Environmental and Social Impact Assessment (ESIA) documentation prepared in relation to the construction of the Kvesheti – Kobi Road Section ("Project"). The preparation and disclosure of this documentation is part of the process of compliance with the Asian Development Bank (ADB) Safeguard Policy Statement (2009) and the European Bank for Reconstruction and Development (EBRD) Environmental and Social Policy (2014).

The ESIA provides a road map to the environmental measures needed to prevent and/or mitigate negative environmental effects associated with the project, and enhance positive impacts. More specifically, the ESIA:

- Describes the existing socio-environmental conditions within the Project Area;
- Describes the project design, construction activities and operational parameters;
- Describes the extent, duration and severity of potential impacts;
- Formulates the mitigation actions
- Presents it all in the form of an Environmental and Social Management Plan (ESMP).

Based on the existing ADB Environmental Safeguards Policy, this Project falls under ADB's project Category A as the project is considered to have significant diverse impacts over a wide area, such as noise impacts, significant quantities of spoil disposal, road safety impacts, and vibration. The Project is also classified as a Category A Project according to EBRD Environmental and Social Policy which classifies construction, realignment or widening of motorways as Category A projects.

2.0 PROJECT BACKGROUND

Due to its geographic location, Georgia's role as a major transit country is significant. Transport of goods into and through Georgia has increased over the past 10-15 years. Almost two-thirds of goods in Georgia are transported by road, and the significant amount of trucks travelling on the country's highways is evident. Many of the roads are however poorly equipped to cope with the volume of traffic and the proportion of heavy vehicles, and factors such as insufficient dual carriageways, routing through inhabited areas and inadequate maintenance create difficulties for haulage companies, truck drivers, Georgian motorists and local residents.

The Government of Georgia has launched a program to upgrade the major roads of the country. The program is managed by the Roads Department (RD) of the Ministry of Regional Development and Infrastructure and aims to improve transportation and transit of goods in Georgia and to surrounding countries.

As a part of the program, upgrading Jinvali-Larsi section of the E117 is planned. The Jinvali-Larsi corridor crosses the Caucasus mountains and aims to improve transportation to and from Russia. It consists of three sections: Jinvali - Kvesheti, Kvesheti-Kobi and Kobi-Larsi. The Kvesheti-Kobi section (hereafter the Project) is the first of the three to be developed and is the subject of this NTShe KK section is the most challenging one as it includes the 9 km main tunnel that will cross the Caucasus ridge and bypass the existent road that connects Kvesheti to Tskere through Gudauri area and the Jinvali pass.

The following main issues are affecting the current status of the road:

- Deterioration of the existing road which is often closed due to snow fall during the winter months thereby impeding the economic development of the Project Area and the region in general;
- Significant increase in congestion on the existing road especially during the tourist season which leads to degradation of air quality in and around Gudauri;

- Difficulties manoeuvring Heavy Goods Vehicles which leads to a high level of delays and demand affected.

The implementation of the Project aims at producing the following benefits:

- Improving operational continuity of North South Highway even during wintertime;
- Improving safety, including reduction in fatality, injury and accident rates especially in the winter when tourist traffic heading to Gudauri will be separated from vehicles in transit to Kobi and beyond;
- Travel time savings for passengers and freight transport. At the same time the existing road will be kept operational thereby acting almost exclusively as access to Gudauri.

The Project, which is the subject of this NTS, focuses on the portion of road between Kvesheti and Kobi.

3.0 PROJECT DESCRIPTION

The project is located in the Dusheti and Kazbegi municipalities, which are part of the Mtskheta-Mtianeti region in the central northern portion of Georgia (see Figure 1).

Figure 1: Project location

From an administrative standpoint, the proposed Project is situated entirely in the Mtskheta-Mtianeti Region, across the Dusheti and Kazbegi municipalities. Specifically, the Project spans from the Kvesheti area and Khada Valley in the Dusheti Municipality to the Kobi area in the Kazbegi Municipality.

The length of the new alignment is 22.7 km and will be divided into two construction packages, or 'Lots' as follows (and shown by Figure 2):

- Lot 1: Tskere – Kobi: Chainage KM 12.7 – KM 22.7 (10 km)
- Lot 2: Kvesheti – Tskere: Chainage KM 0.0 – KM 12.7 (12.7 km)

The Government of Georgia has applied from financing from ADB (for Lot 1 and Lot 2) and EBRD (for Lot 1) towards the cost of the Kvesheti-Kobi road project. The Government will provide counterpart funding to cover taxes and duties, land acquisition and resettlement costs, financing charges, and other miscellaneous costs.

Lot 1 Summary

The Tskere-Kobi portion of the Project road includes an 8.86 km long tunnel (so called Tunnel 5) with two cut and cover sections and a junction connecting to the existing road near Kobi. More specifically Lot 1 includes:

- 178 m long section of road from Tskere to the south portal of Tunnel 5;
- Tunnel 5 - 8.86 km long bidirectional, 2 lanes tunnel;
- Two cut and cover (C&C) sections of the Tunnel (200m – south portal and 8m – north portal) to protect from avalanches and move entrance portal farther from the Tskere;
- 9.06 km emergency gallery parallel to the Tunnel and 17 connections to the main tunnel;
- Technical buildings next to the north and south portals – the buildings include facilities building, pumping station and ventilation room;
- 0.8 km long section of road connecting the north portal of the tunnel with existing road; and
- 214 m long local road diversion.

Lot 2 Summary

The Kvesheti – Tskere section includes a total of 2.5 km of tunnels and 1.5 km of bridges. The main elements of this section are:

- Kvesheti bypass road (length 3.2 km),
- Bridge 1 (length 27.8 m, height 14 m, 2 lane)
- Bridge 2 over the Aragvi river (length 435.28 m, height 62 m, 3 lanes)
- Tunnel 1 (length 1,540.64 m, 2 lanes) with gallery (1,092 m) (New Austrian tunnelling method- NATM 3)
- Bridge 3 - Arch bridge over the River Khadistskali (length 426 m, height 164 m, 3 lane)
- Tunnel 2 (length 193.42 m, C&C, 3 lane)
- Bridge 4 over the left tributary of River Khadistskali river (length 147.80 m, height 26 m, 3 lane)
- Tunnel 3 (length 388.38 m)
- Bridge 5 (length 322 m, height 55 m, 3 lane)
- Tunnel 4 (length 299 m, C&C, 3 lane)
- Bridge 6 (length 218 m, height 48 m, 3 lane)
- Five grade junctions are planned and 3 service roads.

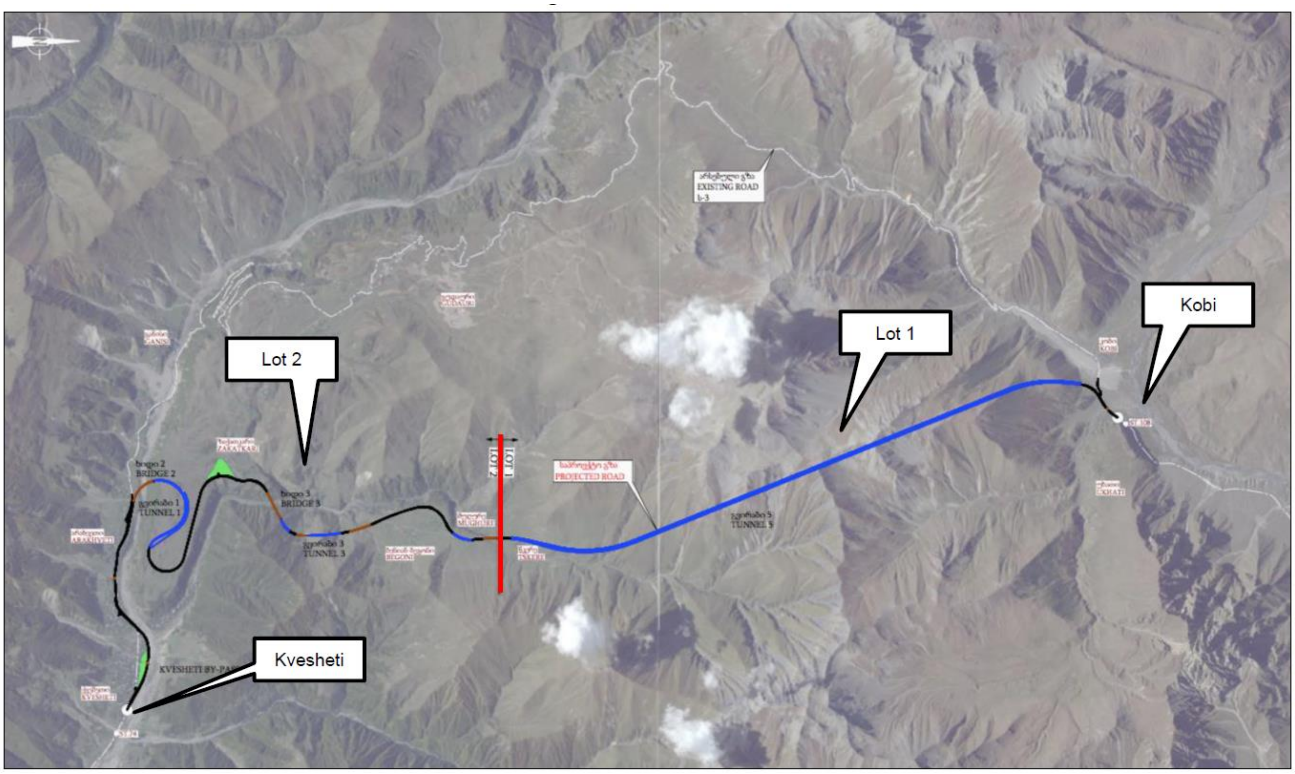


Figure 2: Lot 1 and Lot 2

3.1 Construction process

During the construction phase the following activities will be undertaken:

- **Land Acquisition** – In compliance with ADB and EBRD standards, before the commencement of the construction works, the RD has to prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and EBRD and then implement the plan to acquire the land necessary for the project activities.
- **Specific Environmental Management Plan (SEMP)** – The SEMP will describe the precise location of the required mitigation/monitoring, the persons responsible for the mitigation/monitoring, the schedule and reporting methodology. The SEMP will be prepared by the Contractor within 30 days of Contract award, and will be submitted to RD and to the Engineer for approval. . No construction activities will be allowed until the SEMP is approved. The Engineer will have the specific role of ensuring the implementation of the Project's SEMPs and all related documents.
- **Site Clearing Works –** The Works include site clearing works within or adjacent to the Right of Way (RoW) of the Project Road. Activities will include clearing and grubbing, erosion protection works, removal of any natural or artificial objects within the RoW and removal and disposal of all vegetation and debris within the designated limits of the RoW.
- **Relocation of Existing Services –** The Works include the relocation of all services affecting the construction of the Project Road within the RoW, such as water and sewer mains, overhead electric supply lines, gas pipelines and underground telephone cables.
- **Construction Activities –** The main construction phase aspects are listed below:

- Construction of the tunnel 5 with the Tunnel Boring Machine (TBM);
- Construction of the emergency gallery;
- Construction of the bridges;
- Construction of culverts and other drainage structures;
- Earthworks.

3.2 Schedule and Personnel Involved

The construction phase will last approximately 36 months for Lot 2 and 48 months for Lot 1.

It is expected that approximately 600 direct employment opportunities will be available during the peak of construction (with reduced needs over the other months of construction). This may be divided between two construction 'Lots'. It is estimated that around 10% of the total staff for each Lot will be female. The breakdown of skills required during the construction phase will be as follows:

- Skilled labour:60%;
- Semi-skilled labour: 20%; and
- Unskilled labour: 20%.

4.0 ALTERNATIVES

A series of alternatives have been considered throughout the feasibility study phase and the design process to identify the most suitable solution. The different alternatives are briefly described below.

No Action Alternative

The "No Action" Alternative in this instance is defined as a decision not to undertake the proposed construction of the Project Road. The "No Action" Alternative would see the continuation of the following issues:

- Deterioration of the existing road which is often closed due to snow fall during the winter months thereby impeding the economic development of the Project Area and the region in general;
- Significant increase in congestion on the existing road especially during the tourist season which leads to degradation of air quality in and around Gudauri;
- Difficulties manoeuvring Heavy Goods Vehicles which leads to a high level of delays and demand affected.

In addition, and most importantly the existing road cannot ensure safety and is characterized by high accident rates due to the narrow carriageway, geometry of the road (high gradient and sharp bends), inadequate technical parameters of avalanche protection tunnels and galleries and unprotected landslide prone sections along the road.

Upgrading of the Existing Road (Alternative Zero)

There are a range of technical and safety issues relating to the existing road. Technically, it is possible to upgrade the existing road, but it will not resolve the key issues described below.

It is possible to upgrade the pavement, add safety barriers, slightly upgrade the alignment at some curves (small enhancements at some points) and provide a few galleries. These actions would not have a significant

impact to the landscape/local communities along the existing alignment. But functionality and safety of the road would remain at the same levels. It is possible to accommodate drainage, safety barriers, pavement within the existing road; but not a relevant change avoiding high gradient, U-turns or going through Gudauri.

In order to significantly upgrade the safety and functionality of the existing road the current alignment would need to be significantly changed, enhancing the gradient, minimum radius, cross section (enough space), visibility, etc. This would result in a completely different scenario to what is currently seen. Deep cut-slopes, junctions, tunnels, and bridges would all be required which would have a significant impact on the landscape and the local communities.

Alternative Zero was also assessed from a geological perspective. The alignment of the existing road is located in areas of medium and significant geological risk.

The existing road is also located along a bird migration corridor, that goes along the Tetri Aragvi river close to portions of the fragmented Kazbegi National Park. The proposed Project follows the Tetri Aragvi river for a much shorter portion thereby reducing potential impacts to this area and the newly extended Kazbegi National Park.

Given all of the above constraints Alternative Zero was ruled out for further consideration.

Alternative Alignment

At the outset of the project study, based on initial map assessments, it was generally understood that there would be two possible broadly defined locations for the proposed project road: (i) close to the existing road alignment through the Gudauri valley; and (ii) along a new alignment to the east, through the Khada valley.

The studies commenced with a pre-feasibility study that assessed several alignments in specific corridors within both valleys. The output of this study was refined during the pre-feasibility study down to 4 potentially possible alignments, 2 generally in each valley. These alignments were further assessed via a comprehensive multicriteria analysis approach. The outcome of the process was a rational and evidence-based decision that the proposed road alignment should be in the Khada valley, between Kvesheti and Kobi, and that it should include an 8 km long tunnel through the mountain range between Tskere and Kobi.

The Feasibility study further assessed three potential alignments in the Khada valley.

The chosen alternative which broadly resembles the current alignment was selected for detailed design. Some changes to the alignment were made during the detailed design in order to; a) reflect new environmental legislation, b) reduce risks and impacts, and c) improve the safety of the alignment. The main changes were made in Kobi-Tskere (Lot 2) section. In addition, during the detailed design phase the geometry of the road was improved in some sections, residential areas were bypassed, cut and cover sections increased to reduce noise impacts and underpasses were included.

Technical alternatives

A number of technical alternatives were considered during the design phase, including using alternative pavements, and alternative tunnelling methods.

Alternative transport modes

For the North - South Corridor there is currently no rail network, so building an entirely new route would be vastly more expensive than upgrading the existing road network and furthermore, given the lack of existing network, the construction of the railway north to Russia would likely have much greater environmental impacts than upgrading of the existing road, as it would have to be constructed all the way practically from Tbilisi.

5.0 SUMMARY DESCRIPTION OF THE ENVIRONMENT

For this Project, a general study area of one kilometre around the site was delineated to assess the baseline conditions in the areas likely to be affected by the Project. This is referred to as the Project Area in this report. The Project Area selected for the ESIA includes sensitive receptors that are most likely to be impacted by the Project's development activities. The social area of influence also includes villages that may lie outside the 1km zone due to potential impacts and benefits, such as economic contributions (supply of a local workforce or goods and services) or social effects of in-migration. For biodiversity the ESIA has addressed a project zone of direct influence which is considered to be a 300m working corridor (150m either side of the proposed route) plus additional elements such as access roads, working areas and spoil disposal sites.

5.1 Physical Environment

Topography - The Project Area is mountainous. The relief is mainly hilly, dissected by gorges/gullies and difficult access. Elevation in the Project Area ranges from 1,320 m to 1,975 m. The Project road broadly follows the alignment of two valleys, firstly along Tetri Aragvi river valley, and secondly turning north along the Khada (Khadistskali river) valley before entering the main long tunnel in Lot 1, Tunnel 5.

Geology - Kazbegi region is characterized by a complex geological structure. The geological development history of the region started in the early and middle and upper Jurassic periods. In the Kvesheti-Kobi zone upper Jurassic – lower Cretaceous (Valanginian) flysch formation and Pliocene Quaternary lava flows and volcanic strata are present. The area belongs to Shaori-Pasanauri carbonate flysch of the Mestia-Tianeti zone, Greater Caucasus area.

Soils - The soil types present in the region differ by elevation. Grey and brown forest soils are present in lowlands. In hilly areas, medium and small thickness forest grey soils - humus and calcareous soils are found. At higher elevations forest zone soils are replaced by caespitose and caespitose- turfy soils. Most parts of the Kazbegi territory are covered with mountain and meadow caespitose (up to 1,100 – 2,600 m asl) and primitive soils. The forest light grey soils are found in the gorges of river Tergi and its several tributaries. Alluvial soil is present along the bottoms of the river gorges. In the highland areas soil is devoid of forest cover. Testing of soil quality in Kvesheti and Kobi did not reveal the presence of any levels of contamination in roadside soils elevated above national standards.

Natural Hazards - Due to geological compositions, landforms and steep slopes large amounts of weathered and talus material accumulate at the top of the gorges. Combined with the climatic conditions in the Project Area hazardous processes – floods, flash floods, landslides, mudflows and snow avalanches – can occur. These events occur spontaneously and can be rather strong. Floods and flash floods are typical in the region. These events put communities living in floodplain areas at risk. The tributaries of the Tetri Aragvi are notable for mudflows.

Air Quality - Air quality in the Khada valley is good. No significant sources of air pollution are present. Vehicle emissions are low because of low traffic volumes, and air pollution is rapidly dispersed due to winds. The situation in Kobi and Kvesheti, Arakveti areas is different since the settlements are located along the main road where higher levels of vehicle emissions occur.

Climatic Conditions – The Project Area comprises medium and high mountain areas. Elevation ranges from 870 m to 4,000 m asl, therefore the climate conditions are rather diverse. In the lower areas the climate is moderately humid with mild winter and warm lengthy summer. Average annual temperature in the low-sited areas (870-899 m asl) is 9.7 °C. Precipitation level is around 750 mm. In the higher-sited areas the climate is more humid, precipitation level increases and ranges from 1,200 till 1,600 mm. The climate in Kazbegi municipality is moderately humid. At comparatively low elevation (around 1,700 m, up to 2,000 m) winter is

cold and dry, summer – cool. Steady snow cover persists for 3-4 months. In the 2,000-2,600 m zone winter is comparatively dry, summer – cool and short. Average temperature of around 10 °C lasts 1-3 months. For 4-5 months temperature is below 5 °C. Temperature of the warmest month is 10-14 °C. In the upper zone, west winds dominate. Precipitation level is 1,000-1,200 mm.

Hydrology - The Project road crosses several rivers in the Project Area. Initially it runs adjacent to the Tetri Aragvi river in Kvesheti and Arakveti before crossing the river via Bridge 2 to the Zakatkari plateau. After leaving the plateau the road crosses the Khadistskali river gorge via Bridge 3, a 164 m high arch bridge. After the bridge, the road continues up the Khada valley crossing the Khadistskali river again via Bridge 6 just before Tskere. After leaving the main Tunnel 5 close to Kobi the road crosses Narvani river via an existing bridge. The Narvani is a tributary to Tergi river. The Baidara river also runs west to the site in this area and a connection to the existing road will be provided over this river. The proposed spoil disposal sites for Lot 1 are partly located along Tergi and Baidara rivers, close to Narvani riverbed. Surface water sampling in the Project Area indicates that water quality in the rivers is within the national limits set for surface water bodies.

5.2 Biodiversity and Nature Conservation

The description of the existing biodiversity baseline and conservation status of the Project area has been developed through a combination of desk study, expert consultations, and site surveys. In particular the work has included specific surveys conducted in 2018 for flora, fauna, migratory birds and otters.

The proposed Project lies within the Greater Caucasus Corridor biodiversity hotspot, an area of some 4.68 million hectares that cover most of the middle and high mountain areas of the Greater Caucasus Range. The northern end of the project and northern portal lie within (or under) the proposed Kazbegi Key Biodiversity Area and Kazbegi Important Bird Area which is designated for notable species including breeding populations of Caucasian Black Grouse, Snowcock, Corncrake and several species of birds of prey. The project corridor itself does not appear to be of particular importance for Important Bird Area and Kazbegi Key Biodiversity Area trigger species, with the exception of a pair of Egyptian vultures which are reported to nest in some years near the proposed Kvesheti tunnel. The area is also part of a broad migratory flightpath with over 30,000 raptors a day recorded at peak migration times in the vicinity of the Jvari pass. The high mountains at the back of the Khada valley itself mean, however, that this valley is considered to be of lesser importance, as shown by recent survey results.

The project also runs at a depth of over 200 m under a small portion of the fragmented Kazbegi National Park (which has recently been expanded in area) and proposed Emerald Network site. Whilst this a legally protected area administered by the Kazbegi National Park Administration it will not be affected by the project and the National Parks Authority have confirmed that no specific study is associated with this site. None of the proposed spoil disposal sites are within the National Park.

Georgia has identified 27 priority habitats considered both sensitive and under threat, of which two habitats have been potentially identified within the Project Area. These are grass marshes potentially present on the Zakatkari plateau and areas of sub-alpine birch krummholz near the northern portal of Tunnel 5. Three others “natural” habitats are also present within the Project Area, but all other habitats are considered heavily modified, by a combination of severe over- grazing and agricultural activity around the local villages. None of the proposed spoil disposal sites are within the two priority habitats.

Forested areas within the Project Area are generally patchy and partly modified and of only low-medium conservation value. Limited areas of natural forest are present (e.g. in the Khadistskali gorge) and these are considered to be of medium to high local conservation value. These are typically mixed-species deciduous forests, with oak and hornbeam although at the higher elevations of the northern portal more conifer trees are found. Narrow strips of riparian woodland dominated by *Alnus barbata* are present alongside rivers and streams.

All of the valleys within the Project Area support “braided” rivers with seasonal flows that are heavily dependent upon the time of year (with greatest flow after snowmelt). Of these the three most important for the project are the:

- Tetri (or "White”) Aragvi which runs past Kvesheti (where the road will cross it) and ultimately provides much of the drinking water for Tbilisi
- Khadistskali River which runs through the Tskere valley (the project route) to join the Aragvi at Kvesheti
- Tergi River which runs adjacent to the northern portal of Tunnel 5 before ultimately draining via Russia to the Caspian Sea.

No critically endangered or endangered flora species (either IUCN Red List or Georgian Red List) have been recorded from the Project Area and species recorded or considered potentially present are generally common across the region. Four endemic species of flora were identified in site surveys, mostly around the northern portal of Tunnel 5, however, they are all common in the region.

Three species of birds within the broader Project Area qualify as unique or endemic populations namely Caucasian Black Grouse, Caucasian Snowcock and Corncrake. All three have the potential to be located within the Project Area, although the snowcock is typically found at higher elevations and key local populations for the grouse are found deeper within the National Park. A wide range of important birds of prey are either resident in, or migrate through the Project Area, including Georgian Red List and IUCN ‘vulnerable and ‘endangered’’ species.

19 large mammals are recorded from the broader study area, of which six species are considered both notable and potentially present within the broader area (Brown Bear, Eurasian Lynx, Eurasian Otter, Chamois, Tur and Grey Wolf). Of these only otter, bear and wolf have been confirmed within the road corridor, with the former restricted to river habitats and latter two common across the region. Several other species of small mammals, reptiles and amphibians are also recorded as potentially present in the Project Area, of which the Kazbegi Birch Mouse and Dinniks Viper are considered notable.

Around 30 bat species are found in Georgia, all of which are legally protected. Of these four “notable” species and a further 14 non-notable species may be present in the Project Corridor. Of the notable species one, the Giant Noctule, is considered “Vulnerable” by IUCN, whilst the others are considered “Least Concern”.

Whilst the Project Area itself is not considered to represent especially important habitat for most species of fauna or flora present, for some species such areas are present within the broader National Park. Indeed, for Black vulture, this broader area is considered to represent “Critical Habitat” (in the context of IFC Performance Standard 6 and EBRD Performance Requirement 6) as over half of the national breeding pairs are found within the Park. These birds are not, however, expected to be affected by the Project.

For a number of other “notable” species, habitats in the Park may be considered to represent “Priority Biodiversity Features” (as outlined in EBRD Performance Requirement 6). These include birds such as Egyptian, Bearded, and Griffon vultures, Golden Eagle, Great Rosefinch, Guldenstats Redstart, Corncrake, and Caucasian Black Grouse. The Kazbegi National Park also represents important habitat for several mammal species including chamois, brown bear, lynx, otter and the Kazbegi birch mouse, as well as the endemic Dinniks viper. Certain fish (e.g. trout) in the rivers are also considered nationally at risk. Most of these species will not be materially affected by the project, although Egyptian vulture are believed to breed in the crags near Kvesheti. For these, and other species at greater risk of impact, a precautionary approach has been taken and species-specific action plans have been developed. Moreover, additional biodiversity surveys will be conducted during Spring 2019.

5.3 Socio-Economic Environment

5.3.1 Socio-economic context

The socio-economic household survey undertaken as part of the Land Acquisition and Resettlement Plan interviewed 136 households and 425 individuals in total in the Project Area; of these, 52% were male and 48% female. Of the 425 interviewed individuals, 36 were identified as vulnerable, 35 of them are below poverty line and one is an internally displaced person.

According to the household survey results on employment status, 26% of surveyed people are employed, almost 24% are unemployed, 13% are housewives, 10% are students or pupils, and 19% are pensioners. 70% of household surve respondents receive less than 600 GEL per month. Higher classes of income greater than 1,000 GEL per month are received only in Kvesheti and Arakveti (6% of survey respondents), rather than in the Khada Valley (none of the survey respondents).

Households engaged in the Project Area indicated that agriculture, livestock and apiary are all activities in which they are engaged. Focus Group Discussions also indicated that livestock is the primary financial source for households, while agricultural and apiary activities are generally undertaken for subsistence with excess produce sold for profit. It was reported during stakeholder engagement that roadside markets provide some economic opportunities for local people, for example through selling handcrafts, wild produce and honey.

The population by settlements in the Project Area and the change from 2002 to 2014 census years shows a strong outflow of individuals in both locations over the 12-year period. Migration is a serious issue. The high number of elderly residents was reported in engagement meetings; this is driven by youth leaving the area to receive their higher education, while young parents often move to larger villages in the area (e.g. from the Khada Valley to Kvesheti) or to Tbilisi in order to provide better health care and education for their children.

In many villages remain a number of temporarily occupied, or abandoned, houses. In the Kobi area, 4 of 18 villages have permanent occupants (i.e. 78% are abandoned or have semi-permanent occupancy), while in Kvesheti region, 7 of 31 villages are permanently occupied (i.e. 77% are abandoned or have semi-permanent occupancy). This status limits investment in accommodation improvements and social infrastructure support to smaller villages.

In Kvesheti, it was reported during stakeholder interviews that access to emergency services is limited and is heavily dependent on availability of resources, for example, ambulances. Further, it was described that road accidents happen regularly, but that their severity and wait time for services will determine whether accident victims are transported by road to a nearby health facility, or by helicopter to Tbilisi.

Villages in the Project Area are on the central power supply; for the Khada Valley, villages are connected by a power line from Kvesheti, while in Kobi this connection is from Kazbegi municipality. All villages in the Project Area and all surveyed households have access to electricity. A spring located north to Tskere supplies water to Tskere and the villages located at lower elevations within the Project Area. A simple water supply system consisting of small tank and metal pipes was built in former soviet times. Since then more pipes have been added. The flow is stable throughout the Project Area and only slight seasonal variation can be observed. The quality of water is not controlled.

People in the Khada Valley report that they travel by foot along the road down the valley to get to Kvesheti or try to take the journey with others who may be travelling the route by car (i.e. up to 9 km journey from Tskere), however not all vehicles suitable to travel to the higher elevations in the Valley, particularly in winter, on steep and rough terrain.

Within the gorge area only small tracks are present allowing limited movement of local vehicles to and from the small villages doted around the valley. Accordingly, noise levels in this area are very low, with only wind

and birdsong generating any kind of noise. Accordingly, no baseline noise monitoring has been undertaken in these areas.

Elevated noise in the Project Area is only a result of vehicle movements along existing main roads in Kvesheti and Kobi. There are no elevated noise levels in Khada valley. Baseline noise monitoring undertaken as part of the ESIA indicated that noise levels at the monitored locations are generally above IFC night time limits and within IFC daytime limits. Noise levels are quite constant throughout the day. This is caused by the fact that the major noise sources, the heavy goods vehicles, move along the given road section both, during the day and at night (many of them prefer traveling at night along the less loaded road).

A wide range of physical cultural heritage can be found in the Project Area. The Khadistskali Gorge itself is often referred to as the Gorge of 60 Towers. Accordingly, most of the physical cultural resources identified in the Project Area are towers, in addition to a few churches, some memorials and three cemeteries. Nearly all of the identified physical cultural resources is set back from the proposed alignment more than 50 meters. The exceptions are a religious cross located close to Kvesheti, the cemetery in Tskere, a cemetery in Kobi, a tower on the plateau close to Zakatkari, the remains of a tower close to the interchange on the Begoni plateau and a war memorial in Kobi.

5.3.2 Land acquisition

The Project road passes through a rural area. Most of alignment goes through tunnels. However, a number of private properties and land parcels will be impacted, many of which are used for agricultural purposes. Draft Resettlement Action Plans for Lot 1 and Lot 2 have been prepared according to Georgian Laws, the ADB SPS (2009) and EBRD environmental and social policy (2014). A Land Acquisition and Resettlement Framework has also been developed.

A census was performed to identify all households, land owners, land users and assets impacted by project activities. Summary of the affected households identified during the census are provided below:

- Lot 1: in total 17 households will be impacted as follows:
  - 20 agricultural land plots,
  - 3 residential land plots,
  - 12 fruit trees,
  - 3 residential buildings,
  - 8 gates and fences,
  - vegetables on 5 land plots (3,004 m²), and
  - fodder on 18 plots (27,746 m²)
- Lot 2: in total, 141 households will be affected as follows:
  - 241 agricultural land plots
  - 21 residential land plots
  - 3 commercial land plots
  - vegetables on 30,750 m^2 of land
  - 2,057 fruit trees

- 8 residential buildings
- 2 commercial buildings
- 17 auxiliary buildings
- 91 gates and fence
- 1 business (4 Affected Persons)
- fodder on 133 plots (199,860m²)
- 127 Affected Households (492 Affected Persons) are severely affected
- 25 Affected Households (119 Affected Persons) are vulnerable
- 8 Affected Households (34 Affected Persons) will be relocate.

The affected households will be relocated and the all compensation (for any affected asset) is a monetary one. The owner receives the replacement cost of the affected home and other assets and makes his home where s/he wants. The time bound implementation schedule of the LARP has been prepared in consultation with the RD. All activities related to the land acquisition/resettlement have been planned to ensure that compensation is paid prior to displacement and commencement of civil works construction. Payment of compensation and allowances will commence after a number of preparatory tasks are completed. These tasks are:

1. Signing of contracts with Affected Persons.

2. Disclosure and consultation.

3. Grievance resolution.

4. Requisition to ETCIC (Eurasian Transport Corridor Investment Center) for payment of compensation and allowances.

5. Transfer of compensation and allowance to Affected Persons' bank account and registration of land in PR on RD name.

6. Relocation of affected structures/ assets.

7. Compliance review and reporting.

8. Notice to proceed for Civil works construction.

9. Monitoring.

The RD is the Executing Agency and has the lead responsibility for road construction, as well as the implementation of the LARP.

6.0 SUMMARY DESCRIPTION OF THE IMPACTS IDENTIFIED

6.1 Mitigation, Management and Good Practice Measures

Wherever the Project is likely to result in unacceptable impact on the environment, mitigation measures are proposed. In the case of positive impacts, additional measures are suggested to optimize the benefits to be gained. Where mitigation measures are required, the impact is rated again to show the residual impact after their implementation.

Based on this approach a series of mitigation and management measures have been identified for all the project phases. A number of these measures entail that the Contractor prepares Specific Environmental Management Plans (S-EMP) before the start of field activities. Specific Environmental Management Plans include for example the Air Quality Management Plan, the Spoil Management Plan and the Biodiversity Management Plan. In addition, mitigation measures include that the Contractor employs a number of professionals such as Ecological Clerks of Works and a Cultural Heritage Monitor, who will be in charge of implementing that mitigation measures. In addition to the above, during the operational phase of the Project, a range of good practice measures have been provided to ensure that the road operates with due consideration to the environment and local community.

6.2 Description of the main impacts identified

The identified residual impacts during the **Construction Phase** include:

- Notable Habitats – The Project includes a number of road tunnels, which can be considered a significant avoidance measure, because it reduces possible interferences with the Kazbegi National Park by passing below it. Residual impacts on notable habitats are expected to be **MINOR/MODERATE**. Whilst some non-notable habitats will be lost, use of Ecological Clerks of Works (ECoW) to avoid notable habitats, aligned with sensitive routing, use of TBM, habitat restoration and offsets will reduce such impacts to acceptable levels. In addition, implementation and monitoring of the Biodiversity Action Plan will improve the long-term biodiversity management in the Project area.
- Notable Species – residual impacts on notable species are expected to be **MODERATE**. Direct impacts will be associated with habitat loss, disturbance and accidental mortality. Indirect impacts could also arise from fragmentation of habitats and introduction of people to the valley. The implementation of the proposed mitigations, including the proactive use of the ECoW, and the preparation of appropriate Biodiversity Action Plansfor key species, means that such impacts are, however, expected to be reduced to an acceptable level.
- State Forest Fund – Cutting of the trees during the construction phase will have a negative impact upon habitat and the species in these areas. Residual impacts will be **MINOR / MODERATE**.
- Land acquisition and resettlement – All economic and physical displacement impacts have been duly assessed, quantified, and documented in the LARP. Any unanticipated impacts associated with land acquisition and resettlement will be mitigated to the extent possible during the LARP implementation process and addressed through Grievance Redress Mechanism. A Grievance Mechanism has been prepared to manage complaints received during this process. Residual impacts will be **MINOR / MODERATE.**
- Tunnels – In general impacts will be minor during the construction phase. However, due to the potential impacts on productive boreholes the residual impacts are upgraded to **MINOR / MODERATE**.
- Spoil / Landscape – If the proposed mitigation measures are implemented, including for example the buffer zones for otter protection, impacts should be manageable. However, restoration of any spoil disposal area will take a number of years and as such the residual impacts for the spoil disposal areas are considered **MINOR / MODERATE**.
- Lighting – If the proposed mitigation measures are employed the impacts will be **MINOR/MODERATE** due to the fact that in some instances lighting will be needed during works at night and they could impact upon biodiversity. However, oversight of such works by the ECoW should reduce the incidences of impacts occurring.

- Physical Cultural Resources – The key potential impacts to Physical Cultural Resources during the construction phase relate to vibration, potential encroachment on existing sites and the potential for impacts to unidentified Physical Cultural Resources. However, measures outlined above, including demarcation and fencing of sites and the inclusion of a Cultural Heritage Monitor reduces the potential for significant impacts to occur and as such they are considered **MINOR / MODERATE**.
- Landscape – Construction works, including land clearing, cutting of slopes and developing tunnel portals will have visual impact in the Project area. Impact is considered **MINOR / MODERATE**.
- Noise – Despite the fact that comprehensive mitigation measures have been set to manage construction noise, there may still be instances where construction works may result in unanticipated elevated noise levels. However, this will be only temporary and localized. Impact is considered **MINOR.**

The identified residual impacts during the **Operational Phase** include:

- Air Quality – No significant degradation of air quality is anticipated in the operational phase of the Project in most of the Project Area. However, as traffic levels increase, levels of NO2 are anticipated to rise in the Kobi area, potentially above allowable national limits in 20 years' time (but below IFC limits). However, by 2043 it is fully expected that the vehicle emissions will be lower than today's levels and as such these elevated levels of NO2 may not be realized in the long term. However, based on the model results residual impacts are classified as **LOW / MEDIUM**.
- Greenhouse Gases – Residual impacts from the generation of greenhouse gases will remain throughout the lifecycle of the Project. This is an unavoidable consequence of the Project, but as noted in other sections of this report, the growth of the electric car market and more fuel-efficient cars may, in the future lead to a decrease in the emissions generated on the Project road. Residual impacts will be **LOW/MEDIUM.**
- Notable Habitat – Impacts to notable habitats during operation of the road will result from disturbance, potential pollution and increased access to habitats. Given the proposed mitigation impacts to habitats per se are expected to be of only **LOW/MEDIUM** significance.
- Notable Species – The operation of the road will result in direct impacts to notable species from road traffic accidents as well as indirect impacts associated with disturbance, habitat fragmentation, pollution and increased access to habitats. Given the proposed mitigation, including the use of species-specific Biodiversity Action Plans, such impacts are expected to be reduced to an acceptable level. Residual impacts will be **MEDIUM**.
- Spoil Disposal – Restoration of any spoil disposal area will take a number of years and as such the residual impacts for the spoil disposal areas are considered **LOW / MEDIUM**.
- Tunnels – It is possible that the construction of tunnels could deplete groundwater and affect groundwater users, including water distribution companies. If this is the case affected villagers will be supplied with an alternative source of potable water and methods to compensate any businesses affected will be applied. Residual impacts in this case will be **LOW / MEDIUM**.
- Access and Access Roads – During the operational phase there will be some inconvenience for people using local roads who will have to make some minor detours to access the new road. Pedestrians will no longer be able to walk along the road between Kvesheti and Arakveti, and while alternative routes exist, they may not be as convenient, or as well maintained as the existing road. Residual impacts will be **LOW / MEDIUM**

- Landscape – Cut slopes, embankments, concrete bridges and tunnels will have an impact on the landscape within the valley throughout the Project lifecycle. The mitigation measures may go some way to enhancing the aesthetic value of the Project especially as vegetation grows back around construction zones, and in all likelihood any negative opinion of the new road in terms of visual impact will decrease over time as people get used to the altered landscape. Residual impacts will be **LOW/MEDIUM.** Pictures below show the changes that will be generated by the Project on the landscape.

Figure 3: Kvesheti, Existing situation, East – West view

Figure 4: Kvesheti, Future situation with project, East – West view

Figure 5: Tunnel, Future situation, West – East view

Figure 6: Valley, Aerial view, Existing situation

Figure 7: Valley, Aerial view, Future situation

Figure 8: Valley, Aerial view, Existing Situation

Figure 9: Valley, Future Situation

Figure 10: Tskere, Existing situation

Figure 11: Tskere, Focus on cut and covers and portal of the long tunnel

Figure 12: Kobi, Existing Situation

Figure 13: Kobi, Future situation, portal tunnel, North South view

- Lighting – Even with the proposed light shielding there will still be some level of impact of lighting to the Project Area and the Khada valley. Residual impacts will be **LOW/MEDIUM.**
- Noise – Residual impacts will be negligible for all of the identified receptors if the noise barriers are constructed .Owners of houses that will be subject to elevated noise levels above IFC guideline limits (19 potential receptors identified), will be offered the possibility of relocating after selling their house to the RD; in this case their property will be included in the LARP. However, some property owners may choose to sign the waiver agreement and remain in their homes. These properties may be subject to elevated noise levels above IFC limits in the future, and for these receptors residual impacts will remain throughout the lifecycle of the Project, although in many instances limits will only be breached by 1-3

decibels which is considered to be of minor magnitude. Residual impacts will be **LOW/MEDIUM** due to the potential resettlement aspect.

In addition to the above, a number of beneficial impacts have been identified by the ESIA, they include:

- Economic and Livelihood Impacts – Indirect job generation and procurement opportunities related to Project construction will have a beneficial impact on employment in the Project Area. Opportunities for local and regional suppliers, businesses, and service providers will be created, thus contributing to the positive employment effect as well as indirect job generation and procurement opportunities associated with construction of the Project. The decline in workforce numbers with the commencement of project operations phase will have a marginal detrimental effect on local and regional communities with regards to worker numbers and direct local livelihoods opportunities. Efforts will be made to maximize Georgian work opportunities in the operations and maintenance positions, and establishment of the Project will enable improved transport links (access to market opportunities) thus the overall impact during operations is expected to be beneficial.
- Community Safety and Security – Provision of underpasses and safer driving conditions should result in reduced accident rates. This can also be enhanced by implementation by the RD of community road safety programs, e.g. in schools.
- Visitors centre and opportunities for ecotourism – During project preparation it was identified during consultation with local resident, Kazbegi and Dusheti municipalities, tourism associations, NGOs and other stakeholders that there is a want and need for sustainable tourism development within the region. The proposed Zakatkari Visitor Centre will be developed to serve this need and will be a flagship from which other sustainable development can be networked into the region. In addition, the centre will also be focused to support local livelihood improvement for residents in the Khada Valley and along the new project road. The exact nature of the visitor centre is yet to be confirmed and will be developed following the completion of a specific study where all relevant stakeholders will be consulted. At present elements that have been tabled include the following:
  - Small Scale Agri-market;
  - Visitor Centre;
  - Booking hub;
  - Craft / Cultural Centre;
  - Café / Restaurant / Rest-stop;
  - Hub for conservation activities,

Based on the application of this methodology, the ESIA has established that, with the exception of the residual impacts mentioned above, there are no significant environmental issues that cannot be either totally prevented or adequately mitigated to levels acceptable to the Government of Georgia and international standards for Project activities.

6.3 Cumulative and Induced Impacts

The ESIA has identified a number of potential cumulative and induced impacts that may result from construction and operation of the road, such as increased legal and illegal tree felling, poaching, illegal development and introduction of invasive alien species. Cumulative impacts associated with other plans for the area have been discussed as part of the ESIA including the Gudauri Recreational Area which is deemed to have a beneficial impact in the Project Area. The induced benefits of the Project relate to economic benefits

associated with increased accessibility of households in the area to market opportunities (e.g. tourism), and greater efficiencies of local, regional and international movement of goods along the new alignment

6.4 Monitoring actions

To ensure that all the mitigation actions are completed according to the requirements of the ESIA, monitoring shall be undertaken of Project works by the Contractor and the Engineer. Specifically, both observational monitoring and instrumental monitoring shall be undertaken as follows:

- Instrumental Monitoring – This shall be completed by independent specialists hired by the Contractor and will include routine air quality, water quality and noise monitoring during the construction phase. Schedules, parameters, locations are indicated by the ESMP and in the S-EMP. The Contractor shall be responsible for contracting independent monitoring specialists during the construction phase. The RD will be responsible for operational monitoring, e.g. hiring independent monitoring specialists.
- Observational Monitoring – The Contractor will employ a team of environmental, social and health and safety specialists to continually monitor the works on site. This will also include an Ecological Clerk of Works who will specifically monitor the works to ensure correct application of all biodiversity management and mitigation measures. The Contractors actions shall be continually monitored by the Engineer throughout the Project Construction phase.

7.0 ROLES AND RESPONSIBILITIES

The following roles and responsibilities have been defined within the ESIA.

Road Department

The Road Department is the executing agency and has the lead responsibility for road construction. The Road Department is hence in charge of the overall implementation of the Project throughout its entire life cycle, in line with the indications and commitments identified throughout the ESIA report.

Lenders

The European Bank for Reconstruction and Development (EBRD) and the Asian Development Bank (ADB) act as Project lenders. The lenders ensure that the Project' is implemented in compliance with the ADB Safeguard Policy Statement and EBRD's Environmental and Social Policy.

Contractor

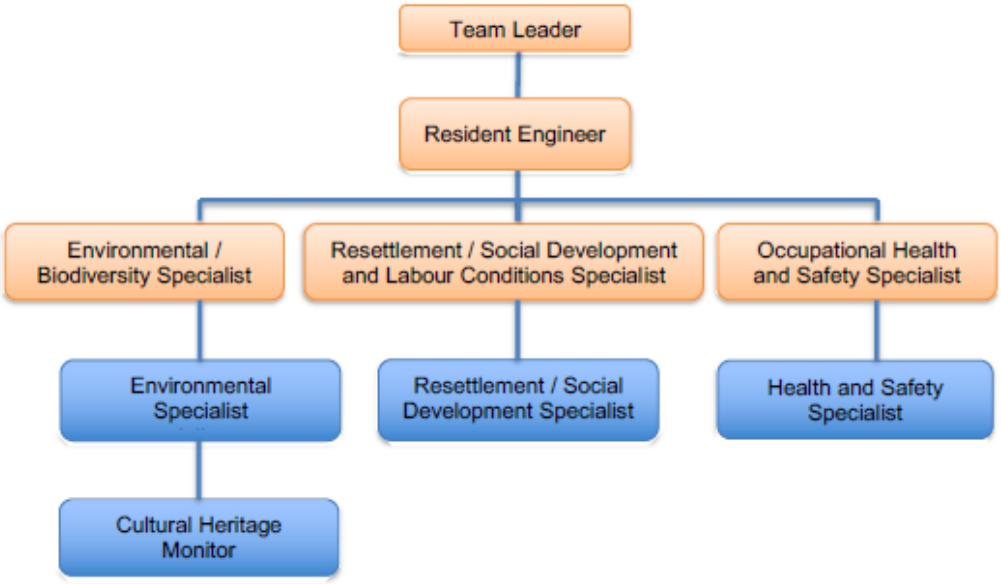
The Contractor will be responsible for the pre-construction and the construction of the Project. One contractor will be selected each project lot through a bidding process carried out by the Road Department. The Contractor will be responsible for implementing all the mitigation measures identified throughout the ESIA. In particular the Contractor will be responsible for the implementation of the requirements of the Environmental Management Plan through his own Specific Environmental Management Plan which will adopt all of the conditions of the Environmental Management Plan and add site specific elements that are not currently known, such as the Contractors construction camp locations.

The Contractor should retain the use of a team of environmental, social and health and safety specialists as shown below:

Engineer

The Engineer (assumed one for both Lots) will ensure the implementation of the Project's EMP, and all related documents.

The Engineer should retain the use of a team of environmental, social and health and safety specialists as shown below:



*International in Orange, National in Blue

8.0 STAKEHOLDER ENGAGEMENT

Stakeholder engagement has been undertaken throughout the development of the ESIA, with the aim to identify and respond to the views of interested and parties potentially affected by the Project throughout the life of the Project, and ensure open and transparent, two-way communication between the RD and stakeholders.

A Stakeholder Engagement Plan (SEP) has been prepared to establish a framework for building and maintaining positive relationships with stakeholders during the entire lifecycle of the project, through the implementation of engagement activities. The SEP is in compliance with national regulations and with the requirements of ADB and EBRD.

Within the purpose of the SEP, stakeholders are defined as persons or groups (i) who are affected or likely to be affected (directly or indirectly) by the project (affected parties); or (ii) may have an interest in the project (other interested parties). The following stakeholder categories have been identified throughout the SEP preparation:

- Affected stakeholders
  - Affected Communities and Individuals
  - Affected Businesses, utilities and other infrastructure owners
  - National Government, Municipal and Regional Administrations
- Interested parties
  - Surrounding Communities
  - Surrounding Businesses and agencies
  - Civil Society Organizations
  - International Parties
  - Press and Media

From April 2018 to February 2019, more than 40 stakeholder engagement events have been held.[1] The events were organized by the RD with support from ADB and EBRD experts as well as consulting firms. They included public meetings, focus group discussions and one-one meetings with affected communities, civil society meetings, and expert consultations with both government and civil society representatives. Guided by the SEP, the events were carried out in line with national requirements as well as those of both ADB and EBRD.[2]

The 40 events broadly covered three topics – EIA process, the LARP, and a proposed eco-tourism component of the project, as listed below:

- Environmental Impact Assessment Process (22 events)
  - 5 public meetings
  - 5 one-on-one meeting days with affected communities
  - 2 civil society meetings
- 8 expert consultation events with NGOs
  - 2 expert consultation events with MoEPA's biodiversity department.
- Land Acquisition and Resettlement Plan (13 events)
  - 6 public meetings with affected communities
  - 7 focus group discussions with affected communities
- Potential Eco-tourism Component of the Project (5 events)

[1] Prior to ADB's involvement in the project (May/2018), consultation events were held during pre-feasibility, feasibility, and design stages of the project, but due to limited information availability, they are not included in this summary.

[2] A project Communications Plan was finalized in February 2019 to guide a range of activities to implement the Stakeholder Engagement Plan that are not event-related. For example, a Frequently Asked Questions (FAQ) and Fact Sheet were recently produced and disseminated.

- 3 meetings with NGOs/Associations
- 2 meetings with municipality mayors – Dusheti and Kazbegi

More than half of the events held during the period were EIA related. These events collected environmental and social baseline data, disclosed the EIA Scoping Report and subsequent draft international and national EIA reports, and gathered feedback to refine the international EIA before its finalization and final disclosure. Georgian law requires one public meeting to disclose the EIA Scoping Report and one public meeting to disclose the National EIA. The Project exceeded this requirement by holding two meetings for each of these disclosure requirements.

The detailed consultations required for LARP preparation are well-advanced with 13 events carried out on LARP preparation. In addition, each household directly affected has been further engaged in preparation of the Detailed Measurement Survey as part of the LARP.

Engagement activities will continue to be implemented in accordance with the SEP throughout the life of a Project; the SEP will be further updated with the results of future engagement activities as these become available.

The RD has a grievance mechanism open to all stakeholders.

Contact details to liaise with the RD are defined as below:

Address: Georgia 0160, Tbilisi, Kazbegi ave N12,

Phone Number: (995 32) 37-05-08

Email Address: Info@georoad.ge

Corporate website: http://www.georoad.ge/

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