



## **Rehabilitation of road and arrangement of parking at Zedazeni Monastery**

# **Environmental Review**

**WORLD BANK FINANCED  
Third Regional Development Project**

**November, 2017**

## Sub-project Description

Under the present sub-project (SP), it is planned to rehabilitate the access road to the Zedazeni Monastery in Mtskheta Municipality. The road starts from village Saguramo and ends on the adjacent territory to the Zedazeni Monastery. The whole length of the rehabilitative road is 6305 m.

Under the SP, the following works are envisaged:

- Arrangement of road bed. Width the roadbed equals to 4.5-6 meters. The road from the both sides will be followed by shoulders of 0,5 m width. Widening of the roadbed is not planned.
- Arrangement of the road pavement. The SP envisages to arrange three types of road cover:
  - Cement-concrete cover within village Saguramo (pk0+00 – pk19+60, 1960 m);
  - gravel cover (pk19+60 – pk61+00, 4140 m)
  - Granite log pavement on parking area and on the road section from parking to the main entrance of the monastery;
- Demolition of the 10 culverts and installation of new ones;
- Installation of 4 new metal culverts;
- Arrangement of 133 m reinforced-concrete retaining wall with average height of 1.0m at the end of the road from pk 61+90;
- Arrangement of safety fence by metal grid from pk61+90- to pk 62+08 on the right side of the road;
- Arrangement of 23 junctions with asphalt-concrete cover and construction of 6 junctions with crushed aggregates; arrangement of 35 entrances to private yards with asphalt-concrete cover and 2 entrances to yard with crushed aggregates;
- Installation of the road signs and guard rail on the dangerous road sections;
- Arrangement of the pavement by granite log on bypass road from main entrance to back entrance of the Monastery along the Monastery wall (length 170 m, width 3-4m).

## Environmental screening

### (A) IMPACT IDENTIFICATION

<p><b>Has sub-project a tangible impact on the environment?</b></p>	<p>The SP has a modest negative environmental impact and it is expected to have tangible long-term positive impact by providing comfortable environment for the local population and tourists.</p>
<p><b>What are the significant beneficial and adverse environmental effects of sub-project?</b></p>	<p>The main impact will be during the construction phase, which includes works for arrangement of the road bed, movement and operation of heavy vehicles, supply of materials.</p> <p>The expected negative environmental impacts are likely to be short term and typical for small to medium scale rehabilitation works: noise, dust, vibration, and emissions from the operation of construction machinery; generation of construction waste; disruption of traffic and pedestrian access.</p> <p>The road to be rehabilitated by the SP is bordered by the Tbilisi National Park. The main risk related to the implementation of this SP is damaging the National Park area (vegetation cover, trees along the road, as well as disturbance of fauna species) due to improperly planned and/or undertaken works.</p> <p>Transportation of the natural construction materials and generated waste will slightly increase a road congestion, will cause disturbance of population/visitors and traffic interruption as well.</p> <p>Increased tourist flows may have indirect negative environmental impacts, such as waste and wastewater generation, vandalism.</p> <p>Road rehabilitation during the high touristic season (June-August) might cause problems with visitors' transportation.</p>
<p><b>May the sub-project have any significant impact on the local communities and other affected people?</b></p>	<p>The SP will have a long term positive social impact through improving living and transportation conditions of the local population and tourists.</p> <p>Considering permanent increase of the visitors' number and traffic along the village Saguramo, the road improvement will significantly decrease traffic problem, noise and dust emission and land erosion. At the same time, it will improve the visual side of the area.</p>

**(B) MITIGATION MEASURES**

<p><b>Were there any alternatives to the sub-project design considered?</b></p>	<p>During the SP design, local conditions, especially borders of Tbilisi National Park and forest, as well as location of private land plots have been considered to avoid civil works within NP or private lands.</p> <p>Discussions were carried out regarding the arrangement of parking and optimal location has been selected. Alternatives of the road pavement have been considered with the Monastery residents and acceptable alternative selected to ensure safe transportation.</p>
<p><b>What types of mitigation measures are proposed?</b></p>	<p>The expected negative impacts of the construction phase can be easily mitigated. The contractor will be responsible for the waste disposal at the permitted location, use the quarry materials from the licensed quarries only, prevent water and soil from pollution (fuel spills due to equipment failure, raw concrete spills), avoid disturbance of population (noise, dust, emissions) through proper work/supplies scheduling, traffic management, good maintenance of the construction machinery.</p> <p>The road is bordered by the forest habitats of the Tbilisi National Park. No changes in the road alignment is envisaged by the SP. Consequently, cut of large trees along the road is not required. Trimming canopies of bushes along the roadsides will be needed for improving visibility.</p> <p>All staff will be strictly prohibited from foraging, logging or other damaging activities of the nearby landscapes of Tbilisi National Park.</p> <p>Large trees along the road will be protected from cutting or unintentional damage by marking and cordoning off with fencing, their root system protected and any damage to the trees avoided.</p> <p>There are no endangered tree species along the road except several walnut trees in village Saguramo.</p> <p>Neither endangered flora and fauna species included in the Red List of Georgia, nor burrows of wild fauna species have been observed along the road during the botanical and zoological surveys, which is likely to be caused due to intensive movement of tourists towards Zedazeni.</p> <p>Traffic management will be required during rehabilitation works on the road.</p>

	All underground communications existing in the zone of work implementation have to be opened before works start to adjust their depth insert and location in the plan. This process has to be monitored by responsible persons for those communications. Adjusted communications have to be fenced with relevant markings.
<b>What lessons from the previous similar projects have been incorporated into the sub-project design?</b>	MDF have wide experience of implementation of medium and large scale road and streets rehabilitation subprojects financed by various donor organizations. Based on lessons learned from previous similar projects, design envisages not only rehabilitation of road pavement but also rehabilitation of storm water ditches which will backing further maintenance of the road cover.
<b>Have concerned communities been involved and have their interests and knowledge been adequately taken into consideration in sub-project preparation?</b>	Draft ER will be available for village Saguramo population and Zedzeni Monastery residents and it will be discussed at the public consultation meeting prior to tending of civil works.

**(C) CATEGORIZATION AND CONCLUSION**

Based on the screening outcomes,

- Subproject is classified as environmental Category     A
- B
- C

Conclusion of the environmental screening:

1. Subproject is declined
2. Subproject is accepted

If accepted, and based on risk assessment, subproject preparation requires:

1. Completion of the Environmental Management Checklist for Small Construction and Rehabilitation Activities
2. Environmental Review, including development of Environmental Management Plan

## Social Screening and Cultural Resource Screening of SP

Social safeguards screening information		Yes	No
1	Is the information related to the affiliation, ownership and land use status of the sub-project site available and verifiable? (The screening cannot be completed until this is available)	X	
2	Will the sub-project reduce people's access to their economic resources, such as land, pasture, water, public services, sites of common public use or other resources that they depend on?		X
3	Will the sub-project result in resettlement of individuals or families or require the acquisition of land (public or private, temporarily or permanently) for its development?		X
4	Will the project result in the temporary or permanent loss of crops, fruit trees and household infra-structure (such as ancillary facilities, fence, canal, granaries, outside toilets and kitchens, etc)?		X
If answer to any above question (except question 1) is "Yes", then <b>OP/BP 4.12 Involuntary Resettlement</b> is applicable and mitigation measures should follow this OP/BP 4.12 and the <b>resettlement Policy Framework</b>			
Cultural resources safeguard screening information		Yes	No
5	Will the project require excavation near any historical, archaeological or cultural heritage site?	X	
If answer to question 5 is "Yes", then <b>OP/BP 4.11 Physical Cultural Resources</b> is applicable and possible chance finds must be handled in accordance with OP/BP and relevant procedures provided in the <b>Environmental and Social Management Framework</b> .			

The road section from village Saguramo to Zedazeni Monsatery and the area for parking arrangement are registered as a state property. Procedures for transfer of road to the Mtskheta municipality is ongoing.

The parking area, access road to the Zedazeni Monastery main gate and bypass to the back entrance are registered as a state property (Tbilisi National Park) and transferred for usage to the Georgian Apostolic Autocephalous Orthodox Church.

# Environmental Review and Environmental Management Plan

## 1. Introduction

### 1.1. Background Information

The Government of Georgia referred to the World Bank with the request to fund the third regional development project (60 million USD). Total value of the project is 75 million USD; among them, the Government of Georgia is providing 15 million USD. The Subproject (SP) implementing organization is the Municipal Development Fund of Georgia (MDF).

The goal of the third project of the regional development is to improve infrastructure services and institutional capacities, supporting development of economics based upon the tourism of Samtskhe-Javakheti and Mtskheta-Mtianeti Regions. It is expected that from the indicated point of view the planned activities will bring direct benefit to the local population of the region – by increasing of reliability of the public infrastructure, improving its availability and quality, increasing of private sector investments, and sales in places of renovated cultural heritage places and towns (tourism related enterprises). In total, it is expected that income of the population will increase and the living conditions improve.

The SP for the **Rehabilitation of road and arrangement of parking at Zedazeni Monastery** is the part of the Third Regional Development Project, which was prepared, updated, approved and is being carried out in accordance with the acting legislation of Georgia and due to the policies of the World Bank.

### 1.2. Institutional Framework

MDF is a legal entity of public law, the objective of which is to support strengthening institutional and financial capacity of local government units, investing financial resources in local infrastructure and services and improving on sustainable basis the primary economic and social services for the local population (communities). MDF is designated as an implementing entity for the RDP and is responsible for its day-to-day management, including application of the environmental and social safeguard policies.

MDF prepares and submits to the World Bank for approval the SP Appraisal Reports (SARs), with safeguards documents attached. These may include, as case may be, an Environmental Review (ER) along with an Environmental Management Plan (EMP), an EMP prepared using the Environmental Management Checklist for Small Construction and Rehabilitation Activities, and a Resettlement Action Plan (RAP).

Mtskheta Municipality is responsible for the operation and maintenance of the road and parking at Zedazeni monastery.

### 1.3 Legislation and Regulations

According the law of Georgia on Permit on Environmental Impact (2008), the SP does not require preparation of EIA and obtaining of Permit on Environmental Impact.

The SP triggers to the OP/BP 4.01 Environmental Assessment and OP/BP 4.11 Physical Cultural Resources safeguard policies.

According to the abovementioned safeguard policies and the Environmental and social Management Framework (ESMF) adopted for the current program, the SP has been classified as B (+) category and requires preparation of Environmental Review (ER) and environmental Management Plan (EMP), in compliance with recommendations of ESMF.

## **2. Subproject Description**

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- Arrangement of the pavement by granite log on bypass road from main entrance to back entrance of the Monastery along the monastery wall (length 170 m, width 3-4m).

## **3. Baseline Environmental Conditions**

Zedazeni Monastery is a Georgian Orthodox monastery, located on the Zedazeni mountain the hills of Saguramo (1390 m), northeast to Mtskheta and to the east side of the Aragvi River. The monastery was founded by Saint John, one of the Holy Assyrian Fathers of Georgia whose mission was to strengthen Christianity in the region. Saint John founded the monastery in the 540s (6th century) on Zedazeni mountain, where prior to Christianity used to be a cult of Zaden, the idol of fruitfulness.



Zedazeni Monastery is located in the Tbilisi National Park. However, under the Decree #731 of December 30, 2007 of the President of Georgia, the user rights to the Monastery area (46 301m<sup>2</sup>) have been transferred to the Patriarchy of Georgia, through alienation (20 years).

At present, an earth road is directed from village Saguramo to Zedazeni Monastery. The road is significantly damaged. The total length of the road section is 6 305 m. Width of the road to be rehabilitated varies from 4 to 6 meters.

The road up to pk5+80 is paved by asphalt-concrete pavement, which is hardly damaged. From pk5+80 the road is not paved. Surface of the road is significantly damaged. The existing culverts are damaged and need replacement. Traffic safety barriers are not arranged.

The first section of the road is located in the village Saguramo. The residential houses and country cottages are located along the road. Second section of the road is bordered by the Tbilisi National Park.

Tbilisi National Park was established in 2007 on the basis of the Saguramo Nature Reserve. Tbilisi National Park is the closest protected area to Tbilisi. However, visitor infrastructure is underdeveloped.

Diverse flora of the Tbilisi National Park is represented by 675 species of herbaceous and arboreal vegetation. Forests of the National Park are in major part represented by - *Quercus iberica* (*Georgian oak*), beech, hornbeam, ash-tree, oriental hornbeam and crab-apple (*Pyrus caucasica*). Boscage species are as follows: hawthorn, dogwood, medlar, prickwood, sumach and other shrubs. There are artificially cultivated pine groves and unique copses of yew in the National Park area. Out of rare and endangered species there are the following ones growing in Tbilisi National Park: box tree (*Buxus colchica*), yew (*Taxus baccata*), Wych elm (*Ulmus glabra*), Caucasian elm (*Ulmus glabra*), walnut (*Juglans regia*), Pontus oak (*Quercus pontica*) etc. Representatives of Tertiary period Colchian flora can be found in this area: holly (*Ilex colchica*), ivy, *Hedera pastuchowii* and *Hedera colchica*, guelder (*Viburnum opulus*), butcher's broom (*Ruscus aculeatus*), yew, Caucasian evergreen azalea (*Rhododendron caucasicum*), cherry laurel (*Prunus laurocerasus*).

Specimen of rare or endangered species are not observed along the road to be rehabilitated within the SP, except several walnut trees within the village Saguramo.

There are prevailing the following species of the mammals at Tbilisi National Park: fox, wolf, roe, hare, marten and weasel. Out of big beasts of prey there are represented the small numbers of lynx and brown bear. Previously the Saguramo Reserve had been famous for population of Red Deer. Various bird species occur in the Tbilisi National Park: Eurasian Jay, Eurasian Blackbird and several species of woodpecker.

12 species of reptiles can be found in Tbilisi National Park, out of which the most prevailing one is the grass-snake.

Neither endangered flora and fauna species included in the Red List of Georgia, nor burrows of wild fauna species have been observed along the road during the botanical and zoological surveys, which is likely to be caused due to intensive movement of tourists towards Zedazeni.

## **4. Analysis of Potential Impact**

### **4.1 Construction phase**

#### **4.1.1 Social Impacts**

- **General set of social issues.** Significant social impact of the rehabilitation and construction activities is not envisaged.
- **Resettlement Issues.** SP does not imply private land acquisition and no temporary or permanent impacts are envisaged on private or leased agricultural lands and private assets or businesses.
- **Positive impact related to Job opportunities for construction workers.** Limited and temporary during construction and limited during operation.
- **Health issues related to noise, emissions, and vibration.** Limited and temporary.
- **Traffic Disruption.** Local traffic can be impacted limited and temporary by transport activities related to the SP.
- **Safety and Access.** There will be no reduced access to areas adjacent to rehabilitation and no potential hazards to vehicles and pedestrians during rehabilitation downtime.

#### **4.1.2. Impacts on the Physical Cultural Property**

The SP envisages arrangement of the parking near the Zedazeni Monastery, as well as arrangement of the pavement by granite log on path from parking to the main entrance of the monastery and on bypass road from main entrance to back entrance of the Monastery along the monastery wall.

No interventions are planned on the structural elements of the CH building. Therefore, the risk of negative impacts on the structural integrity and historical value of the Zedazeni Monastery is minimal.

The chance of the new archaeological discoveries is modest. Nonetheless, during the minor volume of earth works required for the SP implementation and the supervision of an archaeologist, in cases of a possible encountering with chance finds must hold works immediately, inform the Ministry of Culture and Monument Protection in writing, and activity will resume works only upon formal permission from the National Agency for Cultural Heritage Preservation.

#### **4.1.3 Environmental Impact**

##### **Water and soil pollution**

Water pollution may result from a variety of sources, including the following:

- Spillages of fuel, oil or other hazardous substance, especially during refueling;
- Releasing silt water from excavations;
- Silt suspended in runoff waters (“construction water”);
- Washing of vehicles or equipment;
- Exposure of contaminated land and groundwater.

Spillages may travel quickly downhill to a watercourse or water body. Once in a watercourse, it can be difficult to contain the pollution which can then impact over a wide area downstream. It is therefore vital that prompt action is taken in the event of any potential water pollution incident.

Earth works in wet weather may result in uncontrolled release of suspended solids from the work area.

### **Air Pollution and Noise**

Potential impact of air pollution is minimal and related to operation of vehicles and heavy machinery at the construction site and during transportation of materials.

- Noise and vibration arising from heavy machinery and vehicles;
- Air emissions (from vehicles, bulldozers, excavators etc.);
- Dust (from vehicles);
- Fumes may be a concern linked to supply and transportation of materials.

### **Inert Construction Wastes**

The following types of inert and non-hazardous construction waste are anticipated to be produced from these activities:

- Inert materials generated due to the demolition of existing pavement and culverts, such as soil, rock, concrete, and metals.
- Contaminated soil with non-hazardous substance;
- Packaging materials.

Due to generally poor corporate practice of local construction companies applied to managing excess material, there is a high risk of its dumping on the road side downhill or over the growing trees and shrubs. Clearing and removing dumped excess material is rarely possible when works are undertaken in forested areas and mountainous landscapes. Therefore, preventing spoil dumping will be of paramount importance to avoid residual negative environmental impacts.

### **Hazardous Construction Wastes**

Small quantities of the hazardous wastes will arise mainly from the vehicle maintenance activities. A number of hazardous wastes, which could be generated, include:

- liquid fuels;

- lubricants, hydraulic oils;
- chemicals, such as anti-freeze;
- contaminated soil;
- spillage control materials used to absorb oil and chemical spillages;
- machine/engine filter cartridges;
- oily rags, spent filters, contaminated soil, etc.).

### **Transport related impacts**

The following impacts may have generated:

- Noise & Vibration Impacts;
- Traffic congestion (nuisance);
- Air pollution;
- Mud on roads;
- Refuelling, maintenance and vehicle cleaning and related risks of soil and water contamination.

### **Topsoil Losses Due to Topsoil Stripping**

- Topsoil washout due to improper storage and reinstatement;
- Silt runoff to watercourses and water bodies;
- Exposure of contaminated land.

### **Landscape, Vegetation and Fauna**

Main section of the road to be rehabilitated within the SP is bordered on both side by the forest habitates of the Tbilisi National Park. Works in the areas adjacent to this protected area may imply moderate risk of damaging the protected natural site and disturbance of fauna species due to improperly planned and/or undertaken works.

No changes in the road alignment is envisaged by the SP. Consequently, cut of large trees along the road is not required. Trimming canopies of bushes along the roadsides will be needed for improving visibility.

Neither endangered flora and fauna species included in the Red List of Georgia, nor burrows of wild fauna species have been observed along the road during the botanical and zoological surveys, which is likely to be caused due to intensive movement of tourists towards Zedazeni.

## **4.2 Operational phase**

Potential impact related to the operation of the rehabilitated museum would be the following:

- Increase of the number of tourists will result in the increased volume of waste and noise;
- The traffic will increase which will result in the increased level of local emissions and noise as well as traffic safety issues.

Positive social impact will be related to the increasing of the tourist infrastructure that will have positive effect on the local population, in terms of employment.

## 5. Environmental Management Plan

Based on the expected impacts on social and natural environment and on cultural heritage, Environmental Management Plan (EMP) has been developed. ER, including EMP, is an integral part of the construction contract and implementation EMP requirements is obligatory for contractor.

The contractor is required:

1. To obtain construction materials only from licensed providers;
2. If contractor wishes to open quarries or extract material from river bed (rather than purchasing these materials from other providers), then the contractor must obtain licenses for inert material extraction;
3. If contractor wishes to operate own concrete plant (rather than purchasing these materials from other providers), then the contractor must prepare technical report on inventory of atmospheric air pollution stationary source and agree with the Ministry of Environment and Natural Resources Protection (MoENRP);
4. Construction waste must be disposed on the nearest municipal landfill (in village Kavtiskhevi or on Avchala landfill) in accordance with written agreement. The records of waste disposal will be maintained as proof for proper management as designed.
5. If over 200 tons of nonhazardous waste or over 1000 tons of inert materials or any volume of hazardous waste is generated annually as a result of contractor's activities, they shall prepare and cause the Ministry of Environment and Natural Resources of Georgia to approve the Waste Management Plan for the Company, report on waste inventory and appoint an environmental manager, and submit an information on his/her identity to the Ministry of Environment and Natural Resources of Georgia in accordance with requirements of the Waste Management Code.

It is permitted to move the machinery only via the preliminarily agreed routes. Maximal acceptable speed limit shall be limited. The frequency of machinery movement shall be limited.

Uncontrolled storage of hazardous waste is prohibited at the construction site. The construction or municipal waste shall be removed daily from the construction site at the end of each working day. **It is strictly prohibited to dump the excess soil, rocks or removed parts of vegetation on the adjacent slopes.**

At the mobilization stage, all workers shall undergo training on working at high sensitivity areas.

The big trees near the sub-project territory will be marked and fenced, in order to avoid any damage to roots and trees.

In case of chance finds in the process of earth, all activity at the site must be suspended; the works will be renewed only based on the issuance of permission by the National Agency for the Cultural Heritage Preservation of Georgia.

## MITIGATION PLAN

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
<b>Pre-Construction Phase</b>			
Arrangements for waste disposal and borrowing for natural construction materials	Incompliance with the Georgian Law and World Bank policies;  Environmental damage	The following permits/licenses and agreements should be obtained by the works contractor and submitted to the MDF: <ul style="list-style-type: none"> <li>– agreement for disposal (stockpiling) of excessive soil</li> <li>– license for natural construction material extraction (if quarry is to be opened)</li> <li>– Permits for production of such construction materials that belongs to the activity subject to ecological examination (if contractor is the producer)</li> <li>– Technical report on inventory of atmospheric air pollution stationary source and agree with the Ministry of Environment and Natural Resources Protection (MoENRP)</li> <li>– Agreement on household and construction waste disposal.</li> </ul>	Construction contractor
Arrangements for works near or within settlements	Incompliance with the Georgian Law and World Bank policies;  Dissatisfaction of local communities	Place informational banner on the construction site. Include information about the contact persons in the MDF, works supervisor company and local municipality administration to whom people can apply with the complaints on environmental and social issues. Make the banner with weather resistant material. Present information on the banner in Georgian and English languages.	Construction contractor
Arrangements for implementation of environmental measures	Incompliance with the Georgian Law and World Bank requirements;  Environmental damage	<ul style="list-style-type: none"> <li>– Appointing a person responsible for protection of social and natural environment and EMP implementation</li> <li>– Training of workers regarding social and environmental protection measures to be implemented</li> <li>– Delivery of supplies required for implementation of planned mitigation measures</li> </ul>	Construction contractor
<b>Construction Phase</b>			
Construction works, including:	Deterioration of ambient air	<ul style="list-style-type: none"> <li>– All vehicles shall be maintained so that their emissions do not cause nuisance to workers or local people. All vehicles shall be checked and repaired in case of need to eliminate increased level of noise due to damaged parts;</li> </ul>	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
<ul style="list-style-type: none"> <li>- Preparation of construction sites</li> <li>- Earth works</li> <li>- Installation of facilities</li> <li>- Machinery operations</li> <li>- Transportation operations</li> </ul>		<ul style="list-style-type: none"> <li>- Regular maintenance of diesel engines shall be undertaken to ensure that emissions are minimized, for example by cleaning fuel injectors. All plant used on site shall be regularly maintained so as to be in good working order at all times to minimize potentially polluting exhaust emissions;</li> <li>- Vehicle refueling shall be undertaken so as to avoid fugitive emissions of volatile organic compounds through the use of fuel nozzles and pumps and enclosed tanks (no open containers will be used to stored fuel);</li> <li>- Materials transported to site shall be covered/ wetted down to reduce dust. The construction site shall be watered as appropriate. Protective equipment shall be provided to workers as necessary;</li> <li>- During demolition works destruction dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site;</li> <li>- The surrounding environment (sidewalks, roads) shall be kept free of debris to minimize dust;</li> <li>- earth works shall be suspended during strong winds;</li> <li>- Construction materials and storage piles shall be covered;</li> <li>- Stripped soil/ excavated ground shall be stockpiled properly;</li> <li>- There shall be no open burning of construction / waste material at the site;</li> <li>- There shall be no excessive idling of construction vehicles at sites;</li> <li>- The SP territory shall be reinstatement immediately after finalizing of construction works.</li> </ul>	
	Propagation of noise and vibration	<ul style="list-style-type: none"> <li>- The maximum speed shall be restricted in residential areas to the safety level during the pass of the trucks;</li> <li>- Proper technical control and maintenance practices of the machinery shall be applied;</li> <li>- Activities shall be limited to daylight working hours;</li> <li>- No-load operations of the vehicles and heavy machinery are not allowed. Proper mufflers will be used on machinery;</li> <li>- Ensure that machinery is in good technical condition.</li> </ul>	Construction contractor
	Damage of soil	<ul style="list-style-type: none"> <li>- Demarcation of construction sites' boundaries and access roads before construction works are launched;</li> <li>- Adherence to demarcated work site boundaries during operations;</li> </ul>	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
		<ul style="list-style-type: none"> <li>– Stripping of topsoil from work sites (whenever possible) before starting of earthworks and stockpiling for subsequent reinstatement, in compliance with the Technical Regulations on Stripping, Stockpiling, Use and Reinstatement of Topsoil (2014);</li> <li>– Topsoil shall be stored in stockpiles, no more than 2m high with side slopes at a maximum angle of 45°. The following shall also be taken into consideration: <ul style="list-style-type: none"> <li>• Dedicated storage locations shall be used that prevents the stockpiles being compacted by vehicle movements or contaminated by other materials;</li> <li>• Topsoil shall be segregated from subsoil stockpiles;</li> <li>• No material shall be stored where there is a potential for flooding;</li> <li>• No storage at less than 25m from river/streams, subject to the site specific topography;</li> </ul> </li> <li>– Topsoil stripping during heavy rains will not be allowed;</li> <li>– Stored topsoil shall be used for reinstatement and landscaping of the SP area immediately after completion of construction works. As appropriate, this may include leveling of ground surface, reinstatement of topsoil and measures to facilitate natural recovery of vegetation; Topsoil from the sites, which will not be reinstated to the initial conditions shall be distributed carefully on the surrounding area;</li> <li>– In the event that the stockpiles experience significant erosion the contractor will be required to implement corrective action, such as installing erosion matting over the stockpiles if further surface compaction and/or topsoil seeding fails. The Contractor shall protect the stockpiles from flooding and run-off by placing berms or equivalent around the outside where necessary;</li> <li>– subsoil shall be stored in stockpiles, no more than 3m high with side slopes at a maximum angle of 60°; dedicated storage locations shall be used that prevents the stockpiles being compacted by vehicle movements or contaminated by other materials; subsoil shall be segregated from topsoil stockpiles.</li> </ul>	



Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
	Water and soil pollution	<ul style="list-style-type: none"> <li>– Provision of staff with toilets and bathrooms, and centralized discharge of generated wastewater in the sewer systems if possible or install temporary structures;</li> <li>– Ensuring that machinery are well maintained;</li> <li>– Refueling of machinery using respectively equipped refueling trucks, and using of drip trays during refueling operations;</li> <li>– Refueling and maintenance of machinery only at a specially devoted site, where topsoil is tripped and gravel layer is arranged; lubricants, fuel and solvents shall be stored exclusively in the designated sites; No fuel, lubricants and solvents storage or re-fueling of vehicles or equipment will be allowed near the cultural heritage site;</li> <li>– Ensuring that construction materials are appropriately stockpiled and stored in the specially designated and temporarily constructed storage facilities;</li> <li>– Temporarily storage on site of all hazardous or toxic substances shall be in safe containers labeled with details of composition, properties and handling information; Spill containment materials (sorbents, sand, sawing, chips etc.) should be available on construction site;</li> <li>– Ensure that all spills are cleaned up immediately, and contaminated soil is respectively disposed off;</li> <li>– Wet cement and/or concrete will not be allowed to enter any watercourse, pond or ditch.</li> <li>– Cleaning up of the entire SP territory from construction waste as soon as the construction works are finalized.</li> </ul>	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
	Pollution of environment by solid and liquid wastes	<ul style="list-style-type: none"> <li>– Prohibit open air burning of waste;</li> <li>– Do not use paints with toxic ingredients or solvents or lead-based paints;</li> <li>– Collect different types of waste (construction, hazardous, household) separately; designate special sites for waste accumulation and pollution prevention measures shall be applied there;</li> <li>– Dispose non-toxic construction waste and excess soil on the territory allocated by the Mtskheta Municipality or on nearest municipal landfill (in village Kavtiskhevi or on Avchala landfill);</li> <li>– Temporarily storage of all hazardous or toxic substances shall be in safe containers labelled with details of composition, properties and handling information; Uncontrolled storage of hazardous wastes on the construction area is prohibited;</li> <li>– Place containers of hazardous substances in an leak-proof container to prevent spillage and leaching; hand it over to a permitted waste management company, on a contractual basis;</li> <li>– Remove any construction or municipal wastes produced during construction stage from the site area frequently;</li> <li>– Obtain agreements on the disposal of waste prior disposal is undertaken.</li> </ul>	Construction contractor
	Damage of vegetation	<ul style="list-style-type: none"> <li>– Trees, along the road must be protected from cutting or unintentional damage; All large trees shall be marked and cordoned off with fencing, their root system protected, and any damage to the trees avoided;</li> <li>– Protected area in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities.</li> <li>- There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.</li> </ul>	
	Impact on traffic flow	<ul style="list-style-type: none"> <li>– Impose speed limitation to the SP machinery;</li> <li>– Ensure that SP machinery move using only pre-determined routes;</li> <li>– The frequency of machinery movement shall be restricted.</li> </ul>	Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
	Health and safety risks for local community	<p>Construction site shall be properly secured and construction related traffic regulated. This includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• Installation of the signposting, warning signs, barriers and traffic diversions: signs shall be clearly visible and the public warned of all potential hazards;</li> <li>• Construction site and all trenches shall be fenced and properly secured to prevent unauthorized access (especially of children);</li> <li>• Appropriate lighting should be provided;</li> <li>• Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement;</li> <li>• Imposing of speed limitation to SP machinery</li> <li>• Ensuring that SP machinery move using only pre-determined routes</li> </ul>	Construction contractor
	Damage to private property	<ul style="list-style-type: none"> <li>– Ensuring that machinery move using only pre-determined routes;</li> <li>– Imposing of speed limitation to machinery;</li> <li>– Incurred losses shall be fully compensated by the contractor.</li> </ul>	Construction contractor
	Conflicts with local population or other affects people	<ul style="list-style-type: none"> <li>– Meeting with local population (if required)</li> <li>– Reception and addressing of complaints/grievances</li> </ul>	Construction contractor
	Work-site accidents; trauma; casualties at work site	<ul style="list-style-type: none"> <li>– Informing of the SP labor about potential health and safety risks, and instructing them regarding safety measures to be adhered (before launching construction works and during civil works)</li> <li>– Ensuring that required personal protection equipment (e.g. helmets, gloves, etc.) is supplied and used by workers as appropriate</li> <li>– Ensure safety of machinery operations</li> <li>– Provision of safety signs for high risk zones</li> <li>– Implementation of measures recommended for air protection and noise abatement</li> </ul>	Construction contractor
	Impact on cultural heritage	<ul style="list-style-type: none"> <li>– Suspension of construction operations in case of chance finds, informing the MDF and Ministry of Culture and Monument Protection about the chance finding and resume works only after respective permission is issued;</li> </ul>	MDF, Construction contractor

Activity	Expected Negative Impact	Mitigation Measure	Responsible for implementation
		<ul style="list-style-type: none"> <li>– Cleaning up and reinstatement of the SP area immediately after the construction works are completed.</li> </ul>	
<b>Operation Phase</b>			
Maintenance of rehabilitated road	Pollution of the water and soil; Waste generation; Damage of the NP habitats; Disturbance of fauna species.	<ul style="list-style-type: none"> <li>– To agree of road maintenance works schedule with the Tbilisi NP administration;</li> <li>– To avoid dumping of excess soil and inert waste on the adjacent slopes.</li> </ul>	Mtskheta Municipality

## **6. Monitoring**

MDF carries overall responsibility for monitoring of the implementation of the environmental mitigation measures. A consulting company hired for supervision of works will supplement MDF's in-house capacity for tracking environmental and social compliance of works undertaken under this SP. Field monitoring checklist will be filled out and photo material attached on monthly basis. Environmental monitoring of the SP shall be implemented according with plan given below.

Narrative reporting on the implementation of EMP will be provided on monthly and quarterly basis as part of the general progress reporting of MDF. MDF will also be expected to obtain from contractors and keep on file all permits, licenses, and agreement letters which contractors are required have according to the Georgian law for extracting material, operating asphalt/concrete plants, disposing various types of waste, etc.

## **7. Remedies for EMP Violation**

MDF, as a client of construction works, will be responsible for enforcing compliance of contractor with the terms of the contract, including adherence to the EMP.

The contractor is obliged to carry out any of its activities pursuant to the Georgian Environmental Legislation in force, and in case if any noncompliance is revealed, the contractor shall be liable to cover at its own expense all damage liquidation costs.

## **8. Implementation cost**

Costs of implementing the proposed mitigation measures are small and difficult to single out from the costs of construction operations. Nonetheless, it is recommended that Bill of Quantities presented in the tender documentation carry a line item for the disposal of waste and excess materials. Other costs of adherence to good environmental practice and compliance with this EMP are expected to be integrated into the pricing of various construction activities.

## **9. Grievance Redress Mechanism**

Grievance Redress committee will be established at the municipal level. If the grievance will not be solved at the local level, it will be lodged to the MDF. As for grievance monitoring MDF registers all received compliances, comments and how the compliance was addressed. During public consultations, the local population will be informed about the grievance redress issues and received information about contact persons.

## MONITORING PLAN

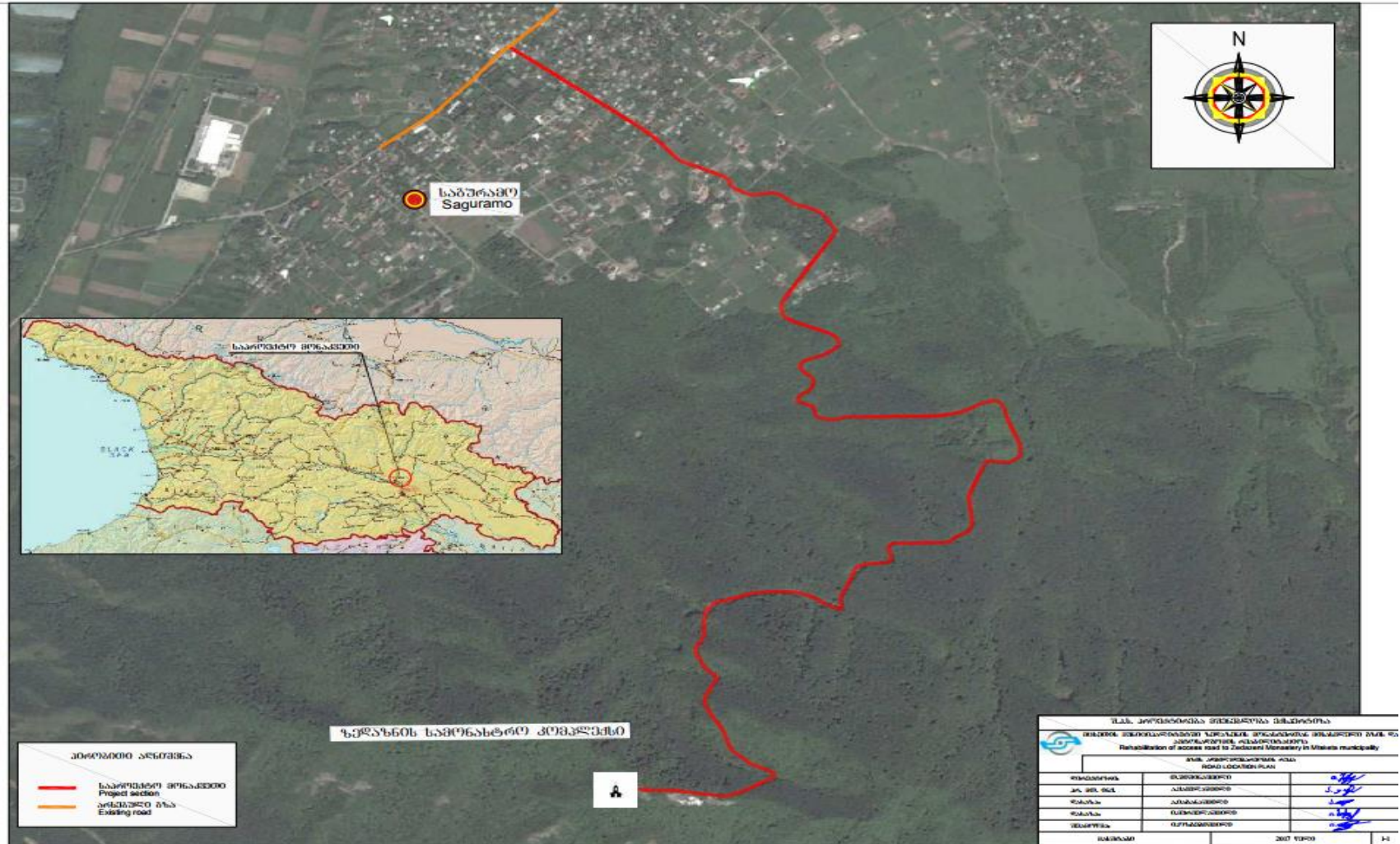
Activity	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Who (Is responsible for monitoring?)
<b>CONSTRUCTION PHASE</b>						
Supply with construction materials	Purchase of construction materials from the officially registered suppliers	In the supplier's office or warehouse	Verification of documents	During conclusion of the supply contracts	To ensure technical reliability and safety of infrastructure	MDF, Construction supervisor
Transportation of construction materials and waste Movement of construction machinery	Technical condition of vehicles and machinery; Confinement and protection of truck loads with lining; Respect of the established hours and routes of transportation	Construction site	Inspection	Unannounced inspections during work hours and beyond	Limit pollution of soil and air from emissions; Limit nuisance to local communities from noise and vibration; Minimize traffic disruption.	MDF, Construction supervisor, Traffic Police
Sourcing of inert material	Purchase of material from the existing suppliers if feasible; Obtaining of extraction license by the works contract and strict compliance with the license conditions; Terracing of the borrow area, backfilling to the exploited areas of the borrow site, and landscape harmonization; Excavation of river gravel and sand from outside of the water stream, arrangement of protective barriers of gravel between excavation area and the water stream, and no	Borrowing areas	Inspection of documents Inspection of works	In the course of material extraction	Limiting erosion of slopes and degradation of ecosystems and landscapes; Limiting erosion of river banks, water pollution with suspended particles and disruption of aquatic life.	MDF, Construction supervisor

	entry of machinery into the water stream.					
Generation of construction waste	Temporary storage of construction waste in especially allocated areas;  Timely disposal of waste to the formally designated locations	Construction site; Waste disposal site	Inspection	Periodically during construction and upon complaints	Prevent pollution of the construction site and nearby area with solid waste	MDF, Construction supervisor
Protection of vegetation and landscape	Works implementation area adjacent to Kazbegi National Park is surrounded with fences. Large trees are protected from cutting or unintentional damage.  Protected area in the immediate vicinity of the activity is not damaged or exploited.	Works implementation area adjacent to Kazbegi national park	Inspection	Periodically during construction and upon complaints	Protection of adjacent landscapes and vegetation	MDF, Construction supervisor  National Park Administration
Traffic disruption and limitation of pedestrian access	Installation of traffic limitation/diversion signage; Storage of construction materials and temporary placement of construction waste in a way preventing congestion of access roads	At and around the construction site	Inspection	In the course of construction works	Prevent traffic accidents; Limit nuisance to local residents	MDF, Construction supervisor

Workers' health and safety	Provision of uniforms and safety gear to workers; Informing of workers and personnel on the personal safety rules and instructions for operating machinery/equipment, and strict compliance with these rules/instructions	Construction site	Inspection	Unannounced inspections in the course of work	Limit occurrence of on-the-job accidents and emergencies	MDF, Construction supervisor
<b>OPERATION PHASE</b>						
Maintenance of rehabilitated road	Maintenance of relevant road signage for traffic safety; Demarcation of the sections of streets under repair; Disposal of asphalt and or other waste from the repair works to the designated landfill.	Rehabilitated sections of roads	Inspection	During maintenance works	Prevent road accidents and disruption of traffic	Mtskheta municipality  National Park Administration



# Attachment I. Site maps of sub-project implementation places and pictures









**Attachmnet 3.** Minutes of public consultation meeting