EXECUTIVE SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT For AMRAN – HAJAH ROAD PROJECT (45 km)

PREPARED BY: IMPLEMENTATION UNIT (IU)

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REPUBLIC OF YEMEN

MINISTRY OF PUBLIC WORKS & HIGHWAYS (MPWH)
ROAD MAINTENANCE FUND (RMF)
ROAD ASSET MANAGEMENT PROJECT (RAMP)
IMPLEMENTATION UNIT (IU)

EXECUTIVE SUMMARY

OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

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EXECUTIVE SUMMARY

1. Introduction

The Amran – Hajja road project is financed under the Second Rural Access Project (RAP2), and managed by the RMF Implementation Unit (IU). This ESIA contains the results of the environmental and social impact assessment undertaken for the Backlog Works and Repairs Phase as well as Routine Maintenance of the project for Amran and Hajja road. It complies with the World Bank’s Environmental and Social Policies and the Relevant Yemen Regulations.

This ESIA document follows the Sectoral Environmental Assessment completed in September 2009. It identifies and assesses the environmental and social risks and impacts. In addition, this report determines the necessary mitigation measures and elaborates the necessary management and monitoring plans to ensure that impacts are dealt with and mitigation measures are followed during construction and maintenance phases. The Environmental and Social Management Plan (ESMP) follows at the end of this report.

The ESIA report was carried out according to the guidelines set out in the Environmental and Social Impact Assessment Framework (ESIAF) Document prepared for the implementation unit within the RMF. The Environmental and Social Review Processes and the Environmental and Social Screening and Scoping Checklist for the Amran-Hajja road were the main tools used during the preparation of this ESIA report.

2. Project Objectives

The project development objective is to upgrade the existing paved road to good conditions and to prevent its future deterioration. Furthermore, to improve traffic safety at critical locations, improve slope stability at mountainous locations, clean cross drainage and side ditches and remove the illegal speed bumps and build new safe speed bumps.

A very important objective is to alleviate poverty in the area by creating local employment through road maintenance works by improving access to basic services such as schools, health centers and markets.

The backlog maintenance works of the proposed project will meet the future demand for better transportation and communication between many districts and villages, such as, Amran City, Qaren area, Al-Ashmoor, Bani Mawhab, Shers- Bani Wardan, Ain Ali, Hajja City from Hajja and Amran governorates. In addition, keeping in view an anticipated overall development in the northern region of the country, it will reduce travel time and reduce the cost of freight traffic between the two governorates.

Moreover, the importance of maintaining this project of 45 km length is to serve directly the Amran-Hajja road with the population of about 2,300,000 inhabitants within the project area. The road attracts freight traffic between Amran and Hajja Governorates.

3. Project Description

The proposed project includes one road connecting the Amran and the Hajja Governorates with the length of 45 km. The Hajja Governorate is located 123 km North-West of Sana’a City. It is bounded by the Red sea, Saudi Arabia, and Sa’ada, Amran, Al Mahweet, and Al Hudaïda Governorates. On the other hand, Amran Governorate is located 50km North of Sana’a City. It is bordered by Saddas, Sana’a, Hajjah, Mahweet, and Al-Jawf and Sana’a Governorates.
The main project activities would include repairs of riprap, road resurfacing, crack sealing, repair and cleaning of shoulders, installation of pipe culverts, installation of road sign, installation of safety barriers and handrails.

4. Legal and Institutional Framework

The ESIA of this project is carried out to meet the requirements of the Environment Protection Law (EPL) No. 26 of 1995 in Yemen that sets the framework for protection of the environment, natural resources, society and health. The provisions of this framework law are implemented through the Executive Regulations (By-Law 148-2000), issued by a decree of the Council of Ministers. According to the Law 25 described above, the EMP is required for road maintenance works.

In addition, this ESIA report has been prepared in conformity with World Bank Operational Policies OP/BP/GP 4.01 triggered by the project.

5. Baseline Conditions

A field study was carried out in details by the environmental, social and gender specialists for the purpose of assessing the existing environmental and social conditions.

a. Physical Region and Land Use

Physical Region: The physiographic characteristics of the project area are very diverse. The Hajja Governorate is located north-west of Sana’a City. The terrain type of this road is mountainous with very high and steep slopes.

Land Use: the road alignment passes through the agricultural land. Most of the terrains have vegetative cover. Agricultural and pastures activities are the major land use characteristic at the project area.

b. Climate, Rainfall and Water Resources

Climate and Rainfall: Hajja Governorate is characterized by arid tropical climate with the mean temperatures ranging from 25°C to 35°C, and the relative humidity of 60-80%. This climate covers the coastal plains region and the lower mountain slopes in the west and south. The climate of the Amran Governorate is affected by the height and the surface level. The rainfall in this area ranges from 70 to 400 mm.

Water Resources: Water is a scarce commodity with fluctuating supply that has been harvested by Yemenis through intricate system. Yemenis for centuries have been constructing terraces to utilize highlands for cultivation, which are also useful in controlling soil erosion.

c. Air Quality and Noise

Air Quality: Data in air quality in Yemen in general and the project area in particular is extremely scarce. No proxy data for the project area were found. However, based on the field visit, it was noticed that the air quality along the road alignment is very good and is currently unlikely to be of any concern.

Noise: The field survey indicated that the current noise levels along the road alignment are low and do not exceed 55dB due to relatively low traffic volume and speed as well as lack of noisy activities along the road alignment.

d. Biological Resources
Road Maintenance Fund (RMF)  
Road Assets Management Project (RAMP)  

Amran-Hajjah Road Project  
Environmental and Social Impact Assessment

Fauna: The most common livestock in the area are goats and sheep. People raise also cows, camels and donkeys. Wild animals are found in different areas, especially predators like lions and tigers. Other animals include monkeys, rabbits, foxes, reptiles and birds. The presence of wild animals is found in sparsely populated areas. The valleys are particularly rich in animal and plant species such as Makhlav, Gadeela, Goma’a and Shares. The plants species includes acacia, lotus and eucalyptus. None of these species are under protection or threat. There are no nature protected areas in the Amran and Hajj governorates.

e. Socio-Economic

The Amran and Hajja Governorates are located in North and West-North of Yemen. Majority of the local population depends on agricultural revenue. The local population still uses the old means of transportation such as donkeys.

The most important agricultural crops are fruits, vegetables and grains. Other agricultural activities include beekeeping and fish farming in coastal areas, livestock cattle, sheep, goats, camels, and donkeys in addition to poultry due to the availability of natural trees & grasses and the appropriate climate. The livestock keeping is particularly intensive in part of the Amran Province where there is arable land which is used for crops in rainfall seasons and for pastures in non-agricultural seasons (the north-western districts such as Harf Sufyan, Alsur and Al Agaflah). The Amran Province is ranked ninth among the provinces of the Yemen Republic in terms of the number of animals, reaching 807 thousands, equivalent to 4.54% of the total number of animals in Yemen (2005 statistical data).

Given that Hajjah borders Saudi Arabia, it witnesses increasing trade activities through the Gateway of Harad City, which is one of the most important customs outlets of the Republic of Yemen. The terrain of the province contains some of the most precious metals such as gold, copper, nickel, cobalt, marble, and quartz.

6. Environmental and Social Impacts

Impact scoping was applied to identify and bring focus of environmental assessment study to the key impacts of high magnitude and significance to be considered in the ESIA and to raise the concerns of the impacted communities and involved institutions. In this report, scoping is limited to the backlog works and repairs phase itself.

Since this project does not involve the construction of new roads, the negative impacts associated with land acquisition are not expected along the Amran-Hajj road. Also, no adverse impacts are anticipated in respect of sensitive habitats, wildlife or cultural heritage.

A number of pre-rehabilitation-related impacts have been identified, most of which are low or moderate. From an environmental and social point of view, the principal concerns are those related to problems associated with:

- Landslides some location of the road due to the mountainous terrain, which the road is crossing;
- Blocked side ditches and cross drainage by accumulated debris;
- The lack of safety measures at sharp curves which cause accidents by negligent driving habits;
- The traffic congestion and jam because of grown small basic shops that are movable along the roadside; and
- The growing natural trees adjacent to the road.
The expected negative social and environmental impacts associated with the construction and maintenance of this project are minor, localized, short-term and reversible. The impact scoping exercise indicates that overall, the beneficial impacts of this project (backlog works and repairs phase) on physical and natural resources, safety; job creation and local economic development are expected to outweigh negative impacts. All potentially adverse impacts arising during the road works could be mitigated satisfactorily through the inclusion of suitable environmental and social mitigation measures and monitoring program attached to the bidding documents.

7. Environmental and Social Mitigation Measures
Mitigation measures will eliminate or reduce the negative impacts of the project. The objective of them is to address the identified negative impacts shown in the screening, scoping and impact analyses. All these mitigation measures should be ensured and approved under the terms of reference and contract for construction and supervision, and as necessary by the agreement with communities that will be stated in the SFA. Therefore, the mitigation plans include measures in order to reduce and mitigate the potentially adverse impacts and strengthening the positives ones.

The key mitigation measures proposed include (Table 1): proper management, temporary storage and safe disposal of construction waste, construction of retaining walls and gabions, water spraying during operations causing dust emissions, control measures for waste fuel, oil and lubricants, reduction of noise and dust levels through restricting working hours and proper maintenance of equipment, rehabilitation of areas used for construction detours and sites used for temporarily storage of construction materials, provision of alternative access to residents and roadside businesses.

Most of the proposed ESMM mitigation activities would be ensured under provisions in the construction supervision contract documents and as necessary by agreement with the communities that will be stated in the SFA. All costs associated with the mitigation measures for all environmental and social impacts would be incorporated into the overall project budget.

8. Environmental and Social Monitoring Activities
The monitoring activities will aim at verifying compliance of project activities with the mitigation measures. It will be the responsibility of the environmental and social specialists’ at the project’s implementation unit. Table 2 presents monitoring activities, and specifies monitoring indicators, frequency, responsibilities and costs. Monitoring activities will rely primarily on field observations, feedback from stakeholders and other affected people, and documentation of their reactions to the project works and their perception of the adequacy of the mitigation measures. Photographic documentation will be required in the continuous and regular monitoring.

The project officer of the Second Rural Access Project (RAP2) shall conduct site inspections every 2-6 weeks to monitor the compliance of the project activities, the contractor and the supervising consultant with the applications of all mitigation measures for environmental and social impacts.

The Environmental and Social Specialists within the (RAP2) are responsible for overall monitoring of the environmental and social issues resulting from the project activities, and review of monthly reports on contractor compliance. The results of the monitoring will be archived in a project dossier for the WB Audit.

9. Environmental and Social Management Plan (ESMP)
The Environmental and Social Management Plan summarizes the findings of the ESIA. It presents the key impacts identified, mitigation measures and monitoring arrangements - see Table 3 for details. The ESMP establishes a procedural framework for implementing and monitoring the environmental and social mitigation measures for the Amran-Hajja project. The estimated costs of implementing mitigation measures is 4,700 USD (assuming good works practices) and the cost of hiring full time environmental monitoring specialist, vehicle and camera.
10. Social Consultations

Social consultations were carried out with both male and female beneficiaries. Consultations with the male beneficiaries from the selected local communities along the road were carried out in December 2012. Four road sites were selected for the consultation process. A total of 25 beneficiaries were randomly selected for the above mentioned sites and interviews. Due to the fact that most of the respondents were illiterate, data was collected by face-to-face interviews. The interviews started by a general talk and a brief explanation of the nature and objectives of the project and the study to gain the trust and confidence of the respondents, and ensure reliable and well informed responses.

Likewise, consultations with the female beneficiaries were carried out in December, 2012 through field visit and interview with women in different areas along the road to be financed by the project. 47 women were interviewed in 3 areas. During the consultation process, questionnaires were also used to solicit people’s views, concerns, and feedback on the road maintenance activities to be supported by the project. The main feedback received was to put traffic signs at places where school children and students cross to schools, also where women and animals cross to fields and where health centers are placed. The consultation participants recommended also setting a group of residents to control traffic movement next to schools during school time, and to build speed bumps near entrance to villages.
**Table 1. Summary of general mitigation measures during the backlog works and repairs phase**

<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Measure</th>
<th>Responsibility</th>
<th>Cost</th>
</tr>
</thead>
</table>
| 1   | Waste generation, storage and disposal | Proper solid waste disposal or liquid waste recycling at designated permitted sites  
Plan for solid and liquid waste management  
Periodic inspection of equipment maintenance | Contractor | 200 USD |
| 2   | Landslides, soil erosion, and visual intrusion | Provision of open area ~1m wide stripe, behind cut side channels, to temporarily accommodate fallen debris  
Increase the mass thickness of the rock fill to provide additional resistance to instability  
Build retaining walls and gabions  
Provision of adequate drainage systems  
Planting trees and restoration of vegetation in sensitive zones | supervision consultants and Contractors  
Part of the contract. Consultants will issue work orders to be financed by the works contracts. |
| 3   | Deterioration of air quality | Usage of well-maintained equipment  
Water spraying during dry periods and strong winds for dust control  
Cleaning of vehicle tires.  
Covering trucks carrying loose construction materials and fill to avoid dust generation | supervision consultants and Contractors | 500 USD |
| 4   | Traffic disruption | Informing the public about schedule of repairs/maintenance works  
Provision of temporary alternative access roads/by-passes  
Installation of traffic signs  
Speed bumps near schools and entrances to villages | supervision consultants and Contractors | Included within the contractor’s fees. |
| 5   | Increase of noise levels | Usage of quiet/well-maintained equipment  
Limiting noisy activities to normal daylight hours  
Inform the public about the location and timing of noisy activities  
Minimizing noisy operations in the Shares market area  
Use of safety instructions and personal protective equipment by workers | supervision consultants and Contractors | Included within the contractor’s fees. |
| 6   | Damage to water supply, drainage system and groundwater | Fixing the damaged riprap after compacting the top soil along the eroded side ditches  
Coordination with land owners on scheduling maintenance activities  
Keeping the drainage ditches and culverts unblocked by periodic cleaning  
Proper side sloping the road to prevent the accumulation of water on the road surface  
Storage of liquid materials (especially hydrocarbons) in sealed containers far away from the water sources in authorized dumpsites | supervision consultants and Contractors | 3,000 USD |
| 7   | Damage to fauna and flora | Planting trees at critical locations and known animal crossing pathways  
Periodic cleaning and maintenance of culverts to facilitate amphibians crossing | supervision consultants and Contractors | 500 USD |
| 8   | Health & Safety | Provision and use of personal protective equipment to workers  
Installing construction and warning signs | Contractor and supervision consultant | Included within the contractor’s fees. |
<table>
<thead>
<tr>
<th>#</th>
<th>Socio-economics</th>
<th></th>
<th>Contractor and supervision consultant</th>
<th>500 USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Informing the public and coordinating with them on the schedule of maintenance activities</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Provision of alternative access roads/ by-passes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Traffic management</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Estimated mitigation costs: 4,700 USD
Table 2. Summary of General Monitoring activities during backlog works and repairs phase.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Parameters to be monitored</th>
<th>Location</th>
<th>Measurements (incl. methods &amp; equipment)</th>
<th>Frequency</th>
<th>Responsibilities</th>
<th>Cost (incl. equipment &amp; individuals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste management</td>
<td>Waste type, quantity, disposal, location of solid and liquid waste generation</td>
<td>Along the road</td>
<td>Maintaining a record of type, quantity, and disposal location of solid and liquid waste generation</td>
<td>Daily</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
</tr>
<tr>
<td>Landslides soil erosion, and Visual intrusion</td>
<td>Landslides soil erosion, and Visual intrusion</td>
<td>Along the road</td>
<td>Site inspection and photographic documentation of excavation and maintenance activities</td>
<td>Once a week. More frequent during the rainy season</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
</tr>
<tr>
<td>Air quality</td>
<td>Dust</td>
<td>Along road and at intersections</td>
<td>Visual observation and photographic documentation of equipment induced emissions and dust clouds during excavation activities</td>
<td>Twice a week</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
</tr>
<tr>
<td>Traffic</td>
<td>Congestion</td>
<td>Along road and at intersections</td>
<td>Site supervision-inspection and photographic documentation</td>
<td>Twice a week</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
</tr>
<tr>
<td>Noise</td>
<td>Hearing noise level</td>
<td>Along the road and at intersections</td>
<td>Site supervision, inspection and documentation to ensure implementation of mitigation measures</td>
<td>Twice a week</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
</tr>
<tr>
<td>Water supply</td>
<td>Water pipes</td>
<td>Along the road</td>
<td>Shares market area</td>
<td>Close supervision and documentation of pipe re-location activities</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
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<tr>
<td>Runoff water and drainage</td>
<td>Vegetation, canals, culverts</td>
<td>Along the road</td>
<td>Site inspection and photographic documentation of re-vegetation activities</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
<td></td>
</tr>
<tr>
<td>Fauna and flora</td>
<td>Vegetation, animals</td>
<td>Along the road</td>
<td>Site inspection and photographic documentation of excavation and re-planting activities</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>Accidents and injuries</td>
<td>Along the road</td>
<td>Inspection/supervision and photographic documentation</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
<td></td>
</tr>
<tr>
<td>Socio-economics</td>
<td>Commercial activities</td>
<td>Along the road</td>
<td>Site inspection and documentation of community activities along road</td>
<td>Supervising consultant in coordination with dedicated engineer-specialist from RMF</td>
<td>Input of full time environmental monitoring engineer/specialist reporting to a dedicated engineer at RMF</td>
<td></td>
</tr>
</tbody>
</table>

Estimated monitoring costs:

Table 3. Summary of ESMP during backlog works and repairs phase.
<table>
<thead>
<tr>
<th>No.</th>
<th>Impact</th>
<th>Mitigation Measures</th>
<th>Responsibility</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Waste generation, storage and disposal</td>
<td>Proper solid waste disposal or liquid waste recycling at designated permitted sites Plan for solid and liquid waste management Periodic inspection of equipment maintenance</td>
<td>Maintaining a record of type, quantity, and disposal location of solid and liquid waste generation</td>
<td>Contractor</td>
</tr>
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<td>2</td>
<td>Landslides, soil erosion, and Visual intrusion</td>
<td>Provision of open area ~1m wide stripe, behind cut side channels, to temporarily accommodate fallen debris Increase the mass thickness of the rock fill to provide additional resistance to instability Build retaining walls and gabions Provision of adequate drainage systems Planting trees and restoration of vegetation in sensitive zones</td>
<td>Site inspection and photographic documentation of excavation and maintenance activities Photographic documentation of planting and re-vegetation activities</td>
<td>Supervision Consultants and Contractors</td>
</tr>
<tr>
<td>3</td>
<td>Deterioration of air quality</td>
<td>Usage of well-maintained equipment Water spraying during dry periods and strong winds for dust control Cleaning of vehicle tires. Covering trucks carrying loose construction materials and fill to avoid dust generation</td>
<td>Visual observation and photographic documentation of equipment induced emissions and dust clouds during excavation activities Measurement of dust, NO\textsubscript{x} and SO\textsubscript{2} concentration in the air (special attention: the Shares Market)</td>
<td>Supervision Consultants and Contractors</td>
</tr>
<tr>
<td>4</td>
<td>Traffic disruption</td>
<td>Informing the public about schedule of repairs/maintenance works Provision of temporary alternative access roads/by-passes Installation of traffic signs Speed bumps near schools and entrances to villages</td>
<td>Site supervision-inspection and photographic documentation</td>
<td>Supervision Consultants and Contractors</td>
</tr>
<tr>
<td>5</td>
<td>Increase of noise levels</td>
<td>Usage of quiet/well-maintained equipment Limiting noisy activities to normal daylight hours Inform the public about the location and timing of noisy activities Minimizing noisy operations in the Shares market area Use of safety instructions and personal protective equipment by workers</td>
<td>Site supervision/inspection and documentation to ensure the implementation of mitigation measures Random noise monitoring (focus: the Shares market area)</td>
<td>Supervision Consultants and Contractors</td>
</tr>
<tr>
<td>#</td>
<td>Impact</td>
<td>Description</td>
<td>Supervision Consultants and Contractors</td>
<td>Cost</td>
</tr>
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</tr>
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| 6  | Damage to water supply, runoff and drainage system | Fixing the damaged riprap after compacting the top soil along the eroded side ditches  
Coordination with land owners on scheduling maintenance activities  
Keeping the drainage ditches and culverts unblocked by periodic cleaning  
Proper side sloping the road to prevent the accumulation of water on the road surface  
Storage of liquid materials (especially hydrocarbons) in sealed containers far away from the water sources in authorized dumpsites | 3,000 USD  
Input of full time environmental monitoring specialist |                |
| 7  | Impact on fauna and flora    | Planting trees at critical locations and known animal crossing pathways  
Periodic cleaning and maintenance of culverts to facilitate amphibians crossing | 500 USD  
Input of full time environmental monitoring specialist |                |
| 8  | Health & Safety              | Provision and use of personal protective equipment to workers  
Installing construction and warning signs  
Inspection/supervision and photographic documentation  
Maintaining a record of injuries and accidents specifying cause and location | Included in the contractor’s fees.  
Input of full time environmental monitoring specialist |                |
| 9  | Socio-economics              | Informing the public and coordinating with them on the schedule of maintenance activities  
Provision of alternative access roads/ by-passes  
Traffic management  
Site inspection and documentation of community activities along road and documented. | 500 USD  
Input of full time environmental monitoring specialist |                |

**Executive Summary**