INTEGRATED SAFEGUARDS DATA SHEET
APPRAISAL STAGE

Date ISDS Prepared/Updated: 11-Jun-2012

I. BASIC INFORMATION

1. Basic Project Data

<table>
<thead>
<tr>
<th>Country:</th>
<th>Ethiopia</th>
<th>Project ID:</th>
<th>P117731</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Ethiopia-Transport Sector Project in Support of RSDP4 (P117731)</td>
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<tr>
<td>Task Team Leader:</td>
<td>Fiona J Collin</td>
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<td></td>
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<tr>
<td>Estimated Appraisal Date:</td>
<td>22-Jun-2012</td>
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<tr>
<td>Estimated Board Date:</td>
<td>27-Sep-2012</td>
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<td>Managing Unit:</td>
<td>AFTTR</td>
<td></td>
<td></td>
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<td>Lending Instrument:</td>
<td>Specific Investment Loan</td>
<td></td>
<td></td>
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<tr>
<td>Sector:</td>
<td>Rural and Inter-Urban Roads and Highways (80%), General transportation sector (20%)</td>
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<tr>
<td>Theme:</td>
<td>Rural services and infrastructure (50%), Urban services and housing for the poor (25%), Trade facilitation and market access (25%)</td>
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Financing (In USD Million)

<table>
<thead>
<tr>
<th>Financing Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>BORROWER/RECIPIENT</td>
<td>46.11</td>
</tr>
<tr>
<td>International Development Association (IDA)</td>
<td>415.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>461.11</strong></td>
</tr>
</tbody>
</table>

Environmental Category: A - Full Assessment

Is this a Repeater project? No

2. Project Objectives

The proposed Project Development Objective is to improve the condition of priority regional trade corridors and link roads being upgraded under this project.

3. Project Description

The Project has two components with a total investment cost estimated at US$461.11 million, of which US$415 million will be financed by IDA.

Component 1 – Upgrading of Regional and Link Roads (US$336.62 million)

This component will finance the upgrading of five selected roads and the corresponding supervision services for each. The supervision services will also include design review and design stage road safety audits for each road. Each of the selected roads are either import/export regional trade corridors, corridors that provide access to investment or development areas, or important link roads that connect trunk roads. Overall, the total length of road to be upgraded is 434.5 km. The component roads are:

(a) Ambo - Weliso, 63.8 km to Asphalt Concrete (AC) standard,
(b) Debre Birhan - Ankober, 42.0 km to AC standard,
(c) Kombolcha - Bati - Mille, 130 km to AC standard,
(d) Mizan - Dima, 91.6 km to AC standard
(e) Konso - Yabelo, 107.1 km to AC standard.

Component 2 - MODERNISATION of ERA (US$ 8.00 million)

To complement the physical works, support is to be provided for the ongoing transformation and modernization of ERA, aimed at further enhancing ERA’s implementation capacity. This support will consist three sub-components:

(a) Sub-Component 2.A: Enhancing the transformation of ERA, focusing on:
   (i) Short term training and visits to selected international road agencies. Twinning arrangements with suitable road agencies may also be considered;
   (ii) Enhancing contract management and safeguards implementation capacity. Technical assistance (TA) will provide mentoring and training in contract management and design review functions, and produce guidelines for use in contract administration and safeguards implementation;
(b) Sub-Component 2.B: Enhancing asset management capacity. This will build on previous support for Output Based and Performance based Road Contracting (OPRC) for Maintenance, by providing TA to develop and supervise an OPRC for Maintenance on a network basis.
(c) Sub-Component 2.C: Provides support to prepare design and feasibility reports of follow-on projects, including Environmental and Social Impact Assessments.

4. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

The specific roads to be upgraded are:
Ambo - Weliso road is located in the Western part of Ethiopia in Oromiya National Regional State, and connects two important trunk roads namely, Addis - Jimma and Addis - Nekemte trunk roads. It will allow connections between the western and southern parts of the country bypassing the capital. The existing gravel road is in poor condition over its 63 km length. The road will provide easy access to highly populated and agriculturally productive areas of Ambo, Wenchii and Weliso Woredas, as well as to areas with high potential for tourism development like Wenchi Crater Lake.

Population of the project area is 508,649, distributed as follows: Ambo Town 67,514; Ambo 110,796; Wenchii 119,736; Weliso 149,874; Welsio Town 60,729. Agriculture is the mainstay for the project area. Mixed farming predominates, with crop production and livestock rearing common in the area. Smaller scale subsistence agriculture is the main character of crop production which is rain fed and traditional style. The major crops produced in the area are Cereals, Pulses and Oil seeds. Since most parts of the project corridor is densely populated and intensively used for agriculture, the negative impacts of the project on flora and fauna is minimal. The detailed Environmental and Social Impact Assessment (ESIA) includes mitigation measures to avoid impact on scattered indigenous tree species and its associated fauna. The Environmental Management Plan in the ESIA proposes mitigation measures to restate borrow pits and quarry sites.

The road passes through ten small settlements and two towns (Haro-Wenchii and Chitu) between Ambo and Weliso town. Properties within the 30m Right of Way (ROW) zone will be acquired and population re-settled. In addition, the project impact will be in locations where land is required for ancillary works, (ie quarry sites, haul roads, borrow pits, camps and detour roads). The social survey indicates that upgrading of the road will affect a total of 6702 house-hold members and 53 Government and public buildings.

Following is the total assets loss either permanently or temporarily:

- Total Project Affected persons: 6702
- Total residential houses and other buildings that will be fully affected: 65
- Total residential houses and other buildings that will be partially affected: 240
- Total number of shops and other buildings to be affected partially and fully: 177
- Total loss of agricultural strips of lands permanently: 19.8 ha
- Total loss of agricultural strips of lands temporarily: 46.80 ha
- Total number of fruit bearing and non fruit bearing trees: 159,891 (including trees within PAP property boundaries)
- Telephone line to be affected: 226 poles
- Electric lines to be affected: 218 poles
- Water pipes, point and well to be affected: 41, 70 and 1 respectively.

B. DEBRE BIRHAN - ANKOBER, 42.9 km

Debre Birhan - Ankober is a gravel road located in the Central part of Ethiopia in Amhara Regional State. The project road starts at Debre Birhan town, about 130 km from Addis Ababa, and then it heads in an easterly direction towards Ankober with a total length of 42.9km, and a ROW width of 30 meters. The road is a major link road and an extension of the Ankober - Awash Arba road project which connects two important trunk roads, Addis - Awash with Addis - Debre Birhan - Dessie. The project road provides a shortest access to Djibouti port for the Central and for some of Northern regions of Ethiopia.

The upgraded road will have many positive impacts - the road will open up market opportunities, provide access to improved and better social service facilities, create improved communication, growth and development of eco-tourism, increase the supply of agricultural inputs, create investment and employment opportunities, contribute to income generating activities, and improve the opportunities for women by creating access to transport and other facilities.

Subsistence farming is the mainstay for about 85% of the population within the project area. Livestock keeping is also practiced, although smaller in scale than cropping. The major types of crops grown in the area include teff, wheat, barley and legumes. Although the road will follow an existing alignment, expansion in some locations will impact on forest lands.

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The potential negative social impacts includes; involuntary resettlement, loss of houses (residential and commercial), loss of business and income, community severance and risk for vulnerable groups, loss of productive resources, loss of farming and grazing land and the disruption of social, cultural and economic ties and networks. A total of 641 people will be affected through full or partial loss of houses or farm-lands. 91 households will be impacted, with 31 household within Ankober town losing their homes permanently who will be relocated within the same town, and the remaining 60 will move temporarily during construction and will return back of their present houses. Majority (83%) of the affected households will lose a strip of their land (less than 5%), and will be able to continue their livelihood in the remaining plot of land; however they will be compensated as per the RAP guidelines for the loss of their crops, trees, and some other perennial crops. The remaining 17% of households will lose more than 20% of their land have to be allocated equivalent land, so as to at least maintain their pre-resettlement livelihoods. As this is a densely populated region there is scarcity of cultivable land and hence, the client will have to ensure they reach an agreement with the Woreda administration to allocate replacement land. The total land required for the restoration of livelihood for the 17% of the households will be 42 ha. In addition to loss of homes, the construction will also affect crops, farmland, electricity poles and lines, telecommunication poles and lines, and also different types of tree species.

The list of affected assets is:
- Number of Project Affected Persons (PAPs): 641
- Number of individual households losing housing structures: 85
- Number of Government and other organizations losing House: 6
- Number of individual households losing fence and gates: 55
- Number of Government and other organizations losing Fence: 15
- PAPs losing farm land: 420
- Number of Government organizations losing farm: 5
- Number of Electricity poles to be affected: 183
• Number of Telephone poles to be affected: 8  
• Number of Water supply lines and points: 8

C. KOMBOCHA – BATI - MILLE, 130 km

The construction of the project road will improve the livelihood of the local area. It could potentially contribute to economic activities and development of trade and urban centers. There will also be improvement of crop and livestock production and its marketing network. The road is 133 km in length and is located in the Northern part of Ethiopia, traversing Afar and Amhara Regions. The road starts at Kombolcha town, about 380 km north of Addis Ababa and passes through Bati town to Mille. The project road is mainly gravel surfaced, with a 42 km section between Kombolcha and Bati paved surfaced with asphalt concrete, all of which is currently in poor condition. The road is a major link between two trunk roads, namely Addis Dessie - Woldiya and Addis - Mille - Dobi - Galafi. It also connects Ethiopia to Port of Djibouti.

The total population in the project influence area is about 472,108. Kombolcha is the largest town along the route with a population of 39,500 inhabitants and Bati which is a small town has 16,450 inhabitants. People in the Amhara region are mainly crop farmers while those in the Afar region are pastoralist and agro pastoralists. Major crops grown are Sorghum, maize and teff. This road section is characterised by scattered and bushy vegetation. It is envisaged that there will be only a minor impact on this vegetation by the road construction.

The project will have negative social impacts such as, loss of homes, productive assets, including strips of farm land and income. In the rural sections of the project road corridor, no households will be displaced from their farmland permanently. However, there will be a small number of households who will permanently lose strips of their farmland along the road frontage although the affected households will be able to continue their livelihood within the remaining plot of land but will be compensated as per the guidelines in the Resettlement Action Plan (RAP) for loss of crops, trees, and perennial crops. No household will require resettlement due to full expropriation of their land by the project road.

Following is a list of PAPs and assets:
• Total Project Affected Persons : 2928
• Government & Religious Institutions: 56
• Area of Farmland to be affected: 31.5 hectares (4.5 permanently 27 hectare temporarily)
• Number of houses to be affected: 962
• Number of Timber trees : 25,351
• Number of Perennial crops (Fruit Trees) : 1,145
• Number of cash crops ( Chat, Coffee, etc ) : 2,184
• Number of Electricity poles: 645
• Number of Telecommunication poles:444

D. MIZAN DIMA, 91.6 km

Mizan - Dima Road section (91.6km) forms part of Mizan - Dima - Boma road and is located in the South Western part of Ethiopia. The project is an extension of Addis - Jimma - Mizan trunk road which will connect South Sudan to Ethiopia. The project will benefit six Woredas: Mizan - Aman, Debub Bench, Guraferda, Surma, Bero and Dima Woredas. The first five Woredas are found in Southern Nations, Nationalities and Peoples Region (SNNPR) while Dima is located in Gambela region. The total population of the project area is estimated at 256,430 (July 2011). Population density is sparsely populated in comparison to other regions in the country. The livelihood of the majority of the project population is agricultural dependent. Farmers produce crops and undertake livestock production side by side. The major crops grown are teff, barley, wheat, millet, rice, maize, sorghum, beans, peas, Soya bean, chickpea, sunflower, sesame, noug & rape-seed. The road will cut through natural forests and woodland. It is envisaged that alternatives will be sought through the ESIA to minimize impacts on natural vegetation.

The project area around Mizan - Aman, Guraferda and Mizan has a population of about 77,751; of which 53% is urban and 47% rural with an average household size of 5. The settlement pattern of the Woreda population is dispersed. The population densities vary from the 14 person/km2 in Guraferda Woreda to 11 person/km2 in Gambela Woreda.

The project area is sparsely populated area with large parts as uncultivated land. There are a number of towns traversed by the project road. The towns are characterized by a high density area like Mizan Teferi and low density area of Guraferda and Dima of the country and the region. The Road mainly involves upgrading to Asphalt Concrete from Mizan to Dima which is 9.6 km, its overall impact on physical environment is not severe. However, due to the development of towns and settlements close to the existing road, its impact on social environment could be significant. Several houses are already constructed within 30 m of road right of way at different stretches of the road. It is estimated that a total of 340 households will be affected due to the project for different reasons. Other impacts include loss of farm and grazing land destruction of natural vegetation situated within the 30 m ROW and loss of road side eucalyptus plantation in most of the road adjacent. The list of affected assets is as follows:

• Number of Project Affected people (PAPs): 2150 (Includes people within households who fully or partially lose their house, and also those people who are affected by loss of a strip of land and those who lose trees).
• Number of households who lose house fully: 73
• Number of households who lose house partially: 267
• Private fences affected in meters: 7,775
• Number of institutional buildings affected partially: 2
• Loss of agricultural lands permanently in hectares: 210
• Loss of agricultural lands temporarily in hectares: 34.8
• Number of households who lose strips of lands in RoW: 16
• Loss of trees in Number : 1168

E. KONSO - YABELO, 107.1 km.

This road starts in Konso town, some 600 km south of Addis Ababa, and runs east to Yabelo ending at the Moyale Junction about 4km past Yabelo. Total length is 107 km. The first 37 km (Konso - Brindar) is dry weather road with no drainage structures; while the next some 65 km (Brindar-Yabelo) is a gravel road; and the last 5 km is asphalt. The 10 km section before Yabelo is hilly. Although the route has undergone previous realignment to an acceptable standard, there is scope for further improvement. Administratively, the first 20 km lies in Konso Special
Woreda of the Southern Region and the remaining part in Teltele and Yabelo Woredas of Borena Zone, Oromia Region. Population of the project area is: Konso Special Woreda 241,801; Teltele 71,721; Yabelo 105,355. The principal economic activity of the project area is agriculture.

The principal economic activity of the project area is agriculture.

Farming is the main activity within Konso woreda (cereals such as maize and sorghum), while livestock rearing (cattle, goat, sheep, camel, equines and poultry) is the main activity for the lowland areas around Borena Zone. The major negative environmental impact identified is soil erosion.

The list of affected assets is as follows:

- Number of household affected: 217
- Affected Fences under: 5032 meters
- Number of fruit and commercial trees situated: 122
- Land requirement for various purposes: 387.3ha
- Number of households who lose trees: 124
- Total number of project affected persons: 1,294

Like in other regions, the RoW is 30 m. The adverse impacts will be due to acquisition of land for road alignment and construction camps and quarries. As the road traverses through three relatively big towns with dense population, the impact will be loss of houses, community infrastructures, fences, trees and land. Common properties will include water sources, religious places, cemeteries, market places, etc. The land acquisition in the initial assessment has revealed that a mosque at Yabelo, a Prot estant Church at Brindarsabian, a Holy Spirit Church at Yabelo town and two burial houses of St. Mary Church at Yabelo would be affected.

On the positive side, the project is expected to reduce vehicle operating costs, reduce travel time, improve potential for economic activities (especially cash crop production), improve environmental conditions, increase non-agricultural employment activity and improve access to markets, schools and health facilities.

5. Environmental and Social Safeguards Specialists

Yasmin Tayyab (AFTCS)
Asferachew Abate Abebe (AFTN1)

<table>
<thead>
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<tbody>
<tr>
<td>Environmental Assessment OP/BP 4.01</td>
<td>Yes</td>
<td>This policy is triggered due to the potential environmental and social impacts of the planned construction of five roads. Environmental and Social Impact Assessments have been prepared for each of five roads. Environmental Management Plans in the ESIAs will be instrumental to avoid and/or mitigate negative environmental and social impacts.</td>
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<tr>
<td>Natural Habitats OP/BP 4.04</td>
<td>Yes</td>
<td>This policy is triggered to ensure that precautionary measures are included in the contract agreement to avoid destruction of natural habitats (e.g. the Enkafo and Gorobela Afaf forests on the Debre Birhan-Ankober RoW). Details on natural habitats and mitigation measures for preventing damage to them are included in the ESIAs.</td>
</tr>
<tr>
<td>Forests OP/BP 4.36</td>
<td>Yes</td>
<td>This policy was triggered because the construction of some of the road projects may affect forest resources (in particular, along the Konso-Yabelo and Mizan-Dima roads). Alternatives and mitigation measures to avoid forest destruction is provided in the ESIAs. Further investigation will be made on the potential damage of the roads on forest resources and mitigation measures will be included in the specific environment management plan to be developed by the contractor. Forest management plans will be prepared as and when necessary.</td>
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<tr>
<td>Pest Management OP 4.09</td>
<td>No</td>
<td>The five road projects do not involve activities that require pesticide use. Neither direct purchase of pesticides nor financing activities that use pesticides will be supported by the project. Therefore this policy is not triggered.</td>
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<tr>
<td>Physical Cultural Resources OP/BP 4.11</td>
<td>Yes</td>
<td>This policy is triggered along with 4.01. Moreover, two of the roads are being constructed in culturally sensitive areas (Debre Birhan-Ankober and Konso-Yabelo roads). Overall care should be taken to avoid damage to cultural resources and the ESIAs include measures to protect cultural resources; these will also be reflected in the contract agreements.</td>
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<tr>
<td>Indigenous Peoples OP/BP 4.10</td>
<td>No</td>
<td>OP 4.10 is not triggered because there are no Indigenous Peoples in the project area.</td>
</tr>
<tr>
<td>Involuntary Resettlement OP/BP 4.12</td>
<td>Yes</td>
<td>The project involves land acquisition. There will be displacement of people and loss of assets and livelihoods in all five roads projects along the road corridor. The road construction will also result in loss of land and properties. Individual RAPs have been prepared for each of the road projects.</td>
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<tr>
<td>Safety of Dams OP/BP 4.37</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>Projects on International Waterways OP/BP 7.50</td>
<td>No</td>
<td>The project is not taking place in or affecting international waterways.</td>
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<tr>
<td>Projects in Disputed Areas OP/BP 7.60</td>
<td>No</td>
<td>The project is not taking place in a disputed area.</td>
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II. Key Safeguard Policy Issues and Their Management

A. Summary of Key Safeguard Issues
1. Describe any safeguard issues and impacts associated with the Restructured project. Identify and describe any potential large scale, significant and/or irreversible impacts:

<table>
<thead>
<tr>
<th>AMBO - WELISO</th>
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<tbody>
<tr>
<td>The project road generally traverses over the western highlands characterized by hilly to mountainous terrain and some flatter areas. The mean annual rainfall of the corridor ranges from 1200 to 1600mm. The mean annual temperature along the route corridor ranges from 15 – 20 degrees Celsius. Most section of the road is located in a high land area and mostly runs on or close to a ridge line or catchment divide, and therefore does not cross major rivers. However, it does cross some perennial rivers and streams, which are located in the lowland parts of the corridor.</td>
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<td>Approximately 65% of the project road traverses intensively and moderately cultivated areas whereas 16.5% passes through towns and villages, and 15% through areas dominantly covered by shrub lands, bush lands or woodlands or dense remnant trees. Much of the natural bush-land has been extensively cleared for agricultural activities and establishment of human settlements, with only small patches of natural vegetation and scattered trees remaining. Important indigenous trees found in the route corridor include Juniper (Yeabesha Tid), Hagenia (Koso Zaf), Acacia (Girar), Albizia (Sassa), Cordia (Wanza), Croton (Bisana), Erythrina (Korch), and Verronia (Girawa).</td>
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<tr>
<td>Since most parts of the project corridor are densely populated and intensively used for agricultural activities, there is little undisturbed habitats that could support wildlife resources. As a result only wildlife adapted to disturbed habitats are found in the area. The wild animals reported to be found in some parts of the road corridor include Common Monkey, Anubis Baboon, Common Jackal, Warthog, Bush Pig, Colobus Monkey, Grey Duiker and Abyssinian Genet. In addition, nocturnal and burrow animals such as Hyena, Crested Porcupine and Aardvark are said to be in the area.</td>
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<td>The main potential environmental and social safeguards include the following:</td>
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<td>(i) Loss of land: Due to widening of the carriageway and alignment improvements, there will be some loss of land. Most of the affected land is under crop production and livestock grazing. Proposed mitigation measures include restoration of areas affected due to temporary activities, and payment of compensation for loss of farmlands, grazing areas and properties.</td>
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<tr>
<td>(ii) Soil erosion, compaction and contamination: Implementation of the road project is likely to cause increased soil erosion during the construction phase. In addition to increased potential for soil erosion, soils may be contaminated by hazardous substances like oils, fuel and detergents resulting from accidental spillage, leakage of equipment and vehicles, or improper disposal of used oils. These impacts can be minimized by implementing the road works during the dry season, construction of effective drainage structures (paved side-drains, diversion drains, check dams, sufficient turnouts), reducing the time surface remains bare following completion of works, planting of appropriate plant species on erosion-prone slopes, and preventing soil pollution by hazardous substances through careful handling and appropriate disposal of used oils through approved waste agencies.</td>
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<tr>
<td>(iii) Impacts on landscape quality and slope stability: Along the sections located in hilly terrain at Ch 21 - 26 km and Ch 28 – 32 km, the road upgrading activities will involve cutting of adjacent slopes. Suitable spoil locations must be found and approved as part of the Environmental Management Plan (EMP) and disposal of excavation materials on downslope must be prohibited. Other activities that may result in disfigurement of the landscape include operation of quarries and borrow pits, and establishment of contractors’ site facilities such as campsites, workshops and construction materials processing sites. Some geological hazard can be expected along a few stretches such as along Ch 22 – 26 km and Ch 28 – 32 km, where loose geological formations, mainly pumice, is observed. Recommended mitigation measures include planting of appropriate grass, shrub or tree species on cut slopes and embankment/fill slopes, avoiding indiscriminate disposal of surplus or unsuitable excavation materials by depositing it only at approved disposal sites, and use of existing material sources and materials processing sites that have been used by former road projects and natural clearings/open lands for contractor’s site facilities. Additional measures include restoration of borrow sites and areas of contractors’ site facilities through back-filling, landscaping and re-establishing vegetation cover, designing and constructing appropriate slope stabilizing structures like retaining walls or gabions at the vulnerable sections, and controlling surface water infiltration to reduce seepage forces by providing adequate side drains, check dams and interceptor drains.</td>
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<td>(iv) Impacts on water resources: The proposed road and drainage works may cause some adverse impacts including increased sedimentation and water pollution of the streams and other watercourses intercepted by the project road or in its vicinity. In addition, water quality of streams, ground water or other sources of water could be impacted due to contamination through spillage of pollutants like fuel and oil, or due to improper disposal of used oil, as well as due to uncontrolled discharge of sewage and other liquid wastes at campsites. Recommended mitigation measures include execution of the potentially impacting road and drainage works during the dry season, use of sediment traps, avoiding disposal of surplus excavated materials on river banks or in river courses, proper handling of oils, fuel, used oil, detergents etc. to avoid water pollution, avoidance of leakages from vehicles and construction equipment by regular and effective maintenance, and provision of satisfactory solid and liquid wastes disposal facilities at construction camps.</td>
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<td>(v) Impacts on water supply systems and competition for water: The project road intercepts about six irrigation canals and several water supply pipelines. In addition, the project may affect a protected spring water source and a pipeline conveying the water to a distribution point at about km 56.70, and unprotected spring water source at about km 29.00. Proposed mitigation measures include designing and implementing the project by shifting the centreline to RHS to protect the spring water source found at km 56.70 LHS, replacing the affected water pipelines and distribution points by new ones, and avoidance of withdrawal of water for the road works or campsite requirements from sources used by the local community unless its sufficiency is approved by the local authorities.</td>
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<td>(vi) Air and noise pollution: During construction phase, air and noise pollution are likely to be significant resulting from increased traffic flows, diversion of traffic to gravel surfaced detour roads, operation of heavy duty machinery, and operation of quarries, borrow sites and materials processing plants. The recommended mitigation measures include restriction of traffic speeds and spraying of water regularly on the road surface, operation of heavy duty machinery, and operation of quarries, borrow sites and materials processing plants. Some geological hazard can be expected along a few stretches such as along Ch 22 – 26 km and Ch 28 – 32 km, where loose geological formations, mainly pumice, is observed. Recommended mitigation measures include restoration of borrow sites and areas of contractors’ site facilities through back-filling, landscaping and re-establishing vegetation cover, designing and constructing appropriate slope stabilizing structures like retaining walls or gabions at the vulnerable sections, and controlling surface water infiltration to reduce seepage forces by providing adequate side drains, check dams and interceptor drains.</td>
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<td>(vii) Impacts on flora: Implementation of the proposed road project is likely to cause loss of some remnant indigenous trees as well as plantation trees found on the roadsides. The stretches or spots which have potentially affected trees include km 0.30 – 1.00, km 15.50 – 15.70, km 25.20 – 26.50, km 28.60 – 28.80, km 29.50 – 30.00, km 33.40 – 33.60, km 34.20 – 34.30, km 43.00 – 44.00, km 47 – 51.20, km 54.60 – 57.20, and 58.10 – 58.70. Major potentially affected tree species include Acacia (Girar), Hagenia (Kosso), Juniper (Yeabesha Tid), Albizia (Sassa), Erythrina (Korch), Eucalyptus (Bahir Zaf), and Cuppressus (Yeferen Tid). Recommended mitigation measures include clearing to pre-defined limits only, adopting reduced ROW and widening/improving the road to one side only, restricting earthworks to the area absolutely necessary for the road works, and applying ‘half-width’ construction method for sections to avoid constructing a side-track through important indigenous vegetation. Uncontrolled side-tipping of spoil on down-side of slopes must be avoided. Suitable and approved spoil areas must only be used.</td>
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</tbody>
</table>
Impacts on fauna: Implementation of the proposed road project will cause minor impacts on wildlife except on birdlife. During construction, the bird species residing in the habitats adjacent to the project road are likely to be disturbed by noise generated from the operation of heavy equipment, noisy plants and construction vehicles. These disturbances may affect nesting and the breeding success of the bird species. Potential impacts on wildlife will be minimized or compensated for by adopting the mitigation measures recommended for the impacts on flora.

Impacts on road and traffic safety: During construction, there will be increased construction vehicles which may increase accident risks to the roadside communities, road users and domestic animals. In particular, the dump trucks transporting construction materials could create more safety risks for road users and villagers. Since the road project is located in a densely populated area, risks due to traffic accidents could be an important issue unless necessary mitigation measures are implemented. Proposed mitigation measures include provision of necessary information such as speed limits, direction, hazard locations, sensitive sites by putting appropriate signals, assigning traffic regulators to control traffic flows at critical sections or periods where/when traffic safety is a serious issue, awareness training of operators of equipment and construction vehicles in traffic safety measures, and establishment of speed limits and controls for construction vehicles and discipline for the drivers.

Socio-economic impacts: The key adverse social impacts include loss of farmlands and crops, demolition of housing units used either for residential or business purposes, impacts on public utilities (water supply, electric and telephone poles), impacts on social services (churches, health units), spread of HIV/AIDS and other STDs, and pressure on local services and facilities, and impacts on settlements. The specified negative impacts could be mitigated by effecting compensation for affected housing units, social services, farmlands and crop losses based on the existing legal frameworks and regulations provided for these sorts of interventions. In addition, the promotion of training and awareness creation on HIV/AIDS and other STDs would help to tackle the threat of the specified problems. Further, in order to avoid pressure on the local services like health and water supply, it is a requirement that the contract documents include provision to supply the specified social services within the camps established for project workers.

Positive impacts will include improvements in horizontal and vertical curves, widening of the road width, provision of shoulders, provision of parking lanes and pedestrian walkways in towns and villages, new drainage structures and replacement of substandard structures, proper side ditches and erosion protection structures, and asphalt pavements. These improvements are anticipated to bring several benefits in terms of environmental protection and road and traffic safety issues during the operation phase. These include avoidance of dust pollution and erosion problem prevailing on the existing gravel road, minimization of erosion from roadside ditches and diversion drains, and reduction of sedimentation of rivers and streams and impacts on water quality. In addition, it is likely to improve sight distance/visibility for drivers and pedestrians, which in turn will reduce accident risks for both motorized and non-motorized traffic, and facilitate traffic flows. Moreover, it will bring better safety for pedestrians and non-motorized vehicles in relation to provision of pedestrian walkways and parking lanes in town and village sections. The expansion of road and transport services in the project area will promote accelerated and sustainable agricultural development in the project area, improving market opportunities for the sale of agricultural products and consumer goods.

DEBRE BIRHAN - ANKOBER

The road route traverses through rolling terrain, while rugged hilly and mountainous topography is encountered towards the last section. The terrain characteristics along the route can be classified as approximately 17 % escarpment, 27% mountainous 44% rolling and 11% flat. The existing road alignment generally follows the ridge and has sharp horizontal curves and steep gradients at some locations.

The socio-economic background of the project area is predominately rural type where majority of the population is dependent on subsistence farming. The major types of agricultural crops that grow in the area include teff, wheat, barley and legumes.

Flora Resources: The vegetation cover of the area is limited to pockets of land and dispersed trees at intervals. Except at Ch 23 – 27 and Ch 39 – 43.3 km, where dense plantation forest is found, there is no significant natural or plantation forest along the route corridor. At Ch 23 – 27 and Ch 39 – 43.3 km the road passes through the Enkafo forest and Gorobela Afafa forest respectively. Enkafo forest consists mainly of eucalyptus and juniperus tree cover, and Gorobela Afaf forest has mixed plant species, both indigenous and exotic. Rare and endangered flora species of the area include Juniperus procera (Ye- Abeshatside), Hagenia abyssinica (Kosso) – a medicinal plant, Olea laoensis (Zigga), Olea Africana (Wanza), Podocarpus gracilar (Birbirssa) and Ficus sur (Warka).

Fauna Resources: There is no registered national park along the road route, but the protected forests of Enkafo and Gorobela Afaf exist within the project ROW and influence area. There are several wildlife resources in those forested sites, especially in the Wof Washa protected forest. Moreover, the diverse physiographic and climatic conditions of the zone are favorable for wildlife habitat. The wild life of the area includes ; Wild goat (Gebero), Monkey (Zingero), Chilada Monkey, Red Fox (Key Kebero), Colobus Monkey (Gureza), Midakwa (Grey Duiker), Minilik Bushbuck (Minilik Dukula), Ape (Tota), Hyena (Jib), African hunting dog (Tekula), Klipspringer (Sesah), Hedgehog (Tekula), Common Bush buck(Tera Dikula), etc. There are several species endemic species found in the project area. Endemic and endangered fauna include; Siditer Birds (Sorene), Chilada Monkey, Red Fox (Key Kebero), Colobus Monkey (Gureza), Midakwa (Grey Duiker) and Minilik Bushbuck (Minilik Dukula). In particular, the Siditer (Sorene) Bird is not found elsewhere in the world.

Historical and Cultural Heritages. North Shoa zone is rich in historical resources. Ankober was established as the site for the Shoan dynasty in 1270, while Ankober Palace (now a ruin) was constructed in 1733 Ethiopian Calendar (EC). Ankober town was burnt down during the Gragn Mohamed invasion in the 17th century and was re-built during the Italian invasion and re-named as Gorobela town. It is likely that remnant buildings may be buried, and excavation in the town must be carried out with caution, giving due attention to chance findings of archaeological resources. Debre Birhan was established in 1446 EC and was administrative center during the reign of Atse ZaraYakob. It is known for its historical and cultural resources including Palaces, Churches, Monasteries, Mosques, monuments and steilae. Sites along the road route include the St Michael church, the surroundings of the Minilik’s Ankober Palace, and Kundi Ghiorgise church. At church sites, undiscovered archaeological resources may also be encountered. The stretch from Gorobela town down to the Palace is highly sensitive as it was occupied by several foreign embassies and consulates (British, French and Italian).

The protected Enkafo forest and Gorobela Afaf forest; the cultural and heritage sites surrounding Menilik Palace and in the premises of Gorobela (Ankober) town are the most sensitive sites for the project. Hence the work at this location should be coordinated and be implemented in consultation with the Woreda environment and land administration office, and culture and tourism offices. No material production site will be opened in those sites, no camping and no detour road construction, no blasting operations and heavy duty machines will be operated at sensitive heritage sites, and no such activities will be allowed. Half width construction system should be adopted within the dense forest areas.
Slope Stabililty
Slope erosion and land slide may encounter at steep cut sections; mostly towards the destination of the road project where mountain sides are traversed. Work at those sites should be done with care and proper slope protection measures put in place. The construction at those locations should be scheduled during dry seasons, and slope protection should be implemented as soon as grading is completed.

Environmental Management Plan
While works are undertaken, strict monitoring and supervision has to be put in place; the supervising consultant should be aware and should make arrangements for preparation of Site specific Environmental Management Plan (SEMP) prior to commencing the construction activity. The SEMP should be checked and confirmed by the consultant, approved by the Environmental Monitoring and Safety Branch (EMSB) of ERA prior to commencing construction on the site. The proposed mitigation management plan and environmental clauses must be properly articulated, made instructive and action oriented, and included in the construction contract document for contractors. Proper implementation of those clauses and specifications and compliance must be closely monitored. Strict environmental compliance auditing must be exercised and reported on monthly and quarterly bases.

KOMBOLCHA - BATI - MILLE

Topography: The topography of the corridor from Kombolcha to ~ Ch 60 km is mainly hilly to mountainous, whereas the section from Ch 60 km to Elwiha (Ch 91) is hilly to rolling and from Elwiha to end of the project is flat lowlands. The terrain is classified as 50% flat, 26% rolling terrain, 22% mountainous and 2% escarpment. The road crosses about 12 major rivers and streams and numerous minor drainage channels. The rivers and streams are the primary sources of water for human as well as livestock consumption. In addition, some of the rivers are utilized for irrigation development. The rivers most used for irrigation are the Cheleka, Dergkoli and Kersa rivers, which cross at Ch 19.70, 29.40 and 38.60 km respectively.

Climate: There are two rainy seasons in the project area, the small rainy season from March to May and the big rainy season from June to September. The mean annual rainfall recorded at Kombolcha, Bati and Mille Stations is 1020mm, 872mm and 308mm respectively.

Potential safeguards Issues - Potential issues and impacts related to the envisaged road upgrading activities include the following:
- Dust and noise pollution during construction activities
- Traffic management and safety risks, both during construction and at completion
- Potential loss of trees and shrubs along river courses, these plant communities are essential to the pastoral community since as they are highly used as a source of livestock feed.
- Irrigation canals and flumes (transferring water over natural drainage channels) located very close to or on the edge of the road are potentially affected. Irrigation canals are located at Ch 37.28 to 37.900 km and flumes at Ch 20.2, 37.28 and 37.745 km.
- Relocation of public utilities such as drinking water supply lines, and electric and telephone poles and lines.
- Loss of water points like ponds found in the bed of seasonal rivers like Bedena and Welanso located under or nearby bridges on the rivers. These are important sources of water supply for the local community and their livestock.
- Demolition of houses and buildings that are being used either for residential or business purposes. The number of potentially affected houses is particularly high in the villages and towns of Degan, Gerban and Bati, where it was recommended that widening of the road should be made on the LHS to avoid the buildings on the RHS.
- Between Ch 15.7 to 19.7 km, along the Cheleka river, the road is vulnerable to erosion and scour problems during peak flood events.

Biological Environment
The natural vegetation in the corridor of the first 54km section has been highly modified by human activities with only remnant bushes and shrubs on the steep mountain slopes and escarpments. The vegetation is dominated by bushy and shrubby plant species, most of which are evergreen ones. The vegetation in the corridor of the remaining section is predominantly open or scattered Acacia bushes and shrubs, and the majority are deciduous and drought tolerant.

Fauna
Because of intense human activities and arid environmental conditions, the project area has limited bio-diversity and low wildlife population. Mammals reported to be found in the project corridor include antelopes such as Bush duiker, Bushbuck, Dik-dik, Soemmerring's Gazelle and Dorcas Gazelle, and African Wild ass, Abyssinian hare, Hyena, Crested porcupine, Common fox, Anubis and Hamadryas baboons, and Grivet monkey. Bird species commonly observed in the area along the project route include Guinea-fowl, Pigeons, Francolin, Doves, Gooses, Bustards, Vultures, Woodpeckers, Swallows, Weavers, and a variety of unidentified species. Ostrich is also present in the lowland areas. According to a necdotal information, there are several species of reptiles and amphibians in the project area, including Giant Tortoise, African python, lizards, and a variety of snakes. None of the fauna identified is endemic to Ethiopia. However, according to the 2006 IUCN Red List of Threatened Species, one species (i.e. African Wild Ass), is critically endangered species, two species (Soemmerring's Gazelle and Dorcas Gazelle) are vulnerable, and one species (Hamadryas baboon) is near threatened; the rest are least threatened. With adoption of appropriate mitigation measures, implementation of the planned road project is not expected to further threaten these wildlife species.
Identified Environmental and Social Impacts

The main identified potential negative environmental and social impacts and their key mitigation measures are:

i. Disfigurement of landscape resulting from deep cuts and widening in mountainous and escarpment areas, disposal of spoil or excess materials on adjacent slopes, quarry and borrow sites, and establishment of contractors’ site facilities. These impacts can be reduced or mitigated by grading of embankment/fill slopes and cut slopes, identifying suitable spoil sites, use of existing quarries and borrow pits and natural clearings/open lands for contractor’s site facilities, and restoration of borrow sites through back-filling, landscaping and re-establishing vegetation cover.

ii. Resulting in mountainous and escarpment areas may induce land-sliding or rock-fall problems at some spots. Extraction of rock materials for aggregate production or masonry works may involve blasting activities. Potential impacts can be minimized by careful design of appropriate slope stabilizing structures, removing all dangerous and loose boulders and rocks from cut faces, banning side-casting of excavation materials on down-slopes, carrying out all blasting following the relevant safety regulations, and announcing the schedule of blasting activities to the vulnerable people in advance.

iii. Soils in the impact zone will be impacted mainly due to increased soil erosion, soil compaction and soil pollution by hazardous substances. Potential impacts can be mitigated by executing the road works during the dry season, limited the use of side-tracks, properly designing drainage structures and outlets, using paved side-drains, diversion drains, check dams, sufficient runoffs, reducing the time surface remains bare following completion of works, planting of appropriate plant species on erosion-prone slopes, and preventing soil pollution by hazardous substances such as fuel and oils through careful handling and appropriate disposal of used oils.

iv. Road upgrading activities are likely to result in increased sedimentation and water pollution risks of rivers and streams crossed by the project road or in its vicinity. In addition, water quality can be impacted due to contamination through spillage of fuel and oil into watercourses, or due to improper disposal of used oil. Possible impacts on water resources can be minimized through execution of the potentially impacting road construction and drainage works during the dry season when river flows are minimal or non-existent, avoiding disposal of excavated materials on river banks or in river courses, proper handling of hazardous substances to avoid water pollution by spillages, avoidance of leakages from vehicles and construction equipment by regular and effective maintenance, and provision of satisfactory solid and liquid wastes disposal facilities at construction camps.

v. The road project is likely to affect an irrigation canal at Ch 37.27 – 37.80 km, and flumes conveying irrigation water at Ch 20.20, 37.28 and 37.74 km. In addition, use of water from existing sources for the road works and campsite requirements may cause significant competition with existing users. The impacts on irrigation structures would be mitigated by providing replacement structures in order to let an uninterrupted flow of the irrigation water, and the water for the road works or campsite requirements shall not be withdrawn from the streams or other sources being used by the local population unless its sufficiency is approved by the local authorities.

vi. Due to the predominantly hilly and mountainous terrain and intensive agricultural activities in the catchments between the start of the project and Ch 54km, there is serious situation problem in the cross- and longitudinal- drainage structures of the project road. To mitigate the impact, it is recommended that the road project allocate some budget to strengthen the soil and water conservation measures being implemented by local offices and the local communities in the project corridor catchments.

vii. During construction phase, air and noise pollution are likely to be significant resulting from increased traffic flows, diversion of traffic to gravel surfaced detour roads, operation of heavy duty machinery, and operation of quarries, borrow sites and materials processing plants. The recommended mitigation measures include restriction of traffic speeds and spraying of water regularly on dusty roads, use of modern and well-maintained equipment, regular maintenance of machinery, plants and vehicles, siting of aggregate production plants and bitumen mixing plants at a minimum distance of 3km from sensitive receptors, application of a well-designed traffic management plan, carrying out noisy construction activities during normal working hours, and informing local people in advance when blasting.

viii. There will be some loss of natural vegetation mainly bushes, shrubs and scattered trees in widening area and where the alignment is improved, and where side-tracks are required and for access to material sources. Potential impacts can be reduced by limiting land taking and earthworks to the area absolutely necessary for the road works, considering the location of important trees during the engineering design as well as construction, constructing the road half-width at a time when passing through protected areas and those sections that have important solitary trees or dense vegetation, preventing spoiling on down-slopes, and implementing replanting program to compensate for trees removed.

ix. The noise resulting from operation of heavy duty machinery and construction traffic will disturb wild animals and birds adapted to use the habitats in the road environment. In addition, some fatalities of wild animals could occasionally result due to collisions with vehicles. Potential impacts can be reduced through avoidance of excessive destruction of wildlife habitats and illegal hunting, applying speed limits for sections passing through important wildlife areas, and strict prohibition of illegal hunting and killing of wild animals by the workforce.

during the construction phase, traffic congestion and accident risks are likely to be issues of major concern. There will be increased accident risks to the roadside communities, road users, project workers and domestic animals due to increased traffic volume on the project road and partial or complete closure of lanes to vehicular traffic. In addition, the road works and traffic movements along the escarpment and mountainous sections are likely to be risky unless special construction methods and traffic management measures are taken. The potential problems can be minimized through provision of appropriate traffic management devices, signage and traffic controllers, awareness training for operators of equipment and construction vehicles in traffic safety measures, and establishment of speed limits and controls for construction vehicles.

xi. Land will need to be acquired within the ROW area. These impacts will be mitigated through application of the Resettlement Action Plan (RAP).

xii. Project workers and truck drivers are considered to have high potential to spread HIV/AIDS and other STDs. Since the project road is export-import corridor it is used by a large number of heavy trucks, and hence, many truck drivers and their assistants opt to stay overnight in the towns located along the project road. This situation attracts commercial sex workers to the area and this makes the project area highly vulnerable to the spread of HIV/AIDS and other STDs. Recommended preventive measures include provision of awareness raising and education campaigns about HIV/AIDS and other STDs among the construction workers and local population, and provision of condoms.

xiii. Impacts on malaria transmission: Since the project area is endemic for malaria, formation of stagnant water points in quarries, borrow sites and drainage ditches may create conducive environment for the breeding of vector mosquitoes and this situation may intensify malaria transmission amongst the local population and the project workers as well. Proposed mitigation measures include preventing formation of stagnant water points or removal of vector breeding sites, provision of impregnated mosquito nets for the project workers, use of insect repellents, and medical treatment of infected cases.

MIZAN - DIMA

The Mizan-Dima Road, approximately 92 km in length, is in South Ethiopia in the SNNPR Regional state, and follows an existing road corridor, except for minor realignments to achieve better road geometry.

Climate: The rainfall at Mizan is in order of 2000mm/yr falling almost all the year with maxima in between March and October. Temperature is in the order of 250°C. The highest records are in June and July. The lowland areas towards the border are semi-arid and temperature high in the
Terrain: The general terrain condition is between highlands on Southern and low lands in the Northern direction. The terrain classification is flat and rolling in general. Flat (5%); Rolling (85%); Mountainous (10%)

Flora: The vegetation on the highland is montane moist forest ecosystem comprises high forests of the country mainly the southwest forests. The montane moist forest ecosystem is distinguished also by supporting luxuriant growing epiphytes Canarina, Orchids, Scadoxus and fern plants such as Platycerium and Drynaria. Mosses also occur in the wettest forests associated to major branches and banks of trees. The upper canopy is occupied by the spectacular emergent trees of Potuiera adolfi-friederici. Other characteristic species in the canopy include Olea capensis subsp. welwitschii and subsp hochstetteri, Prunus africana, Albizia schimperiana, Millettia ferruginea and Celtis africana. Others such as Polycias fulva, Schefflera volkensii, Trelitepis madagascariense, Schefflera abyssinica, Bersama abyssinica, Minmosops kummel are also associated to it. Sub-canopy species include Croton macrostachyus, Cordia africana, Dracena steudenii, Syzygium guineense sub-sp. afrormontanum, Sapium ellipiticum, Ilex mitis, Erythrina brucei and Rothmannia urcelliformis. The shrub layer consists species of Coffee arabica, Galiniera saxifraga, Teclea nobilis, Ocotea kenyensis, Clausena anisata, Measa Incelatola and Maytenus spp.

The Woody climbers are Urea hypselodendron, Landolphia owarenasis, Embelia schimperi and Jasminum spp. The ground vegetation are mainly herbaceous plants including Acanthus, Justicia, Piperoma, Galiniosa, Impatients, Utica and several grass species. In the attempt of classification of the vegetation types in montane moist forests of Ethiopia, Lisaneokwork Nigatu and Mesfin Tadesse (1989) and Kumilawesh Yeshiltlla (1997) recognised five and nine association groups at Harenna and Southwest forests, respectively. Plant community types recognised at Harenna forest have shown distinct variation in their composition and structure of the vegetation across altitudinal changes, while those community types from Southwest forests were described mainly by their dominant species.

Fauna: Common Jackal, Wild Dog, Wild Cat, Bush Pig, Giant Forest Hog, Warthog, Bush Bug, Colobus Monkey, Olive Babbon, Grey Duicker and Bush Babby. Although complete inventory is lacking some of the montane moist forest ecosystem is recognized to be important bird areas of Ethiopia. For example, Bonga forest consists of more than 15 highland species of birds, Metu-Gore-Tepi forest consists of more than 16 of which at least two are endemic, and Tiroy forest have also more than 32 highland biome species of Birds (EWNHS, 1996). There are No wildlife sanctuaries or protected site habitats in the study corridor. Therefore direct destruction of valuable wildlife habitats and impediments to wildlife movements is not expected during construction or operation of the Project Road.

Land-use: The livelihood of the population is mainly agricultural, dominated by cash crop production on the highlands as well as from honey, spices and fruits. Land-use along the road corridor can be generally defined as: Plantations (Coffee, Enset and banana) 63%; Bush, Woodland and Forest (15%); Settlements (11%), Savanna (11%). Cultural, Archaeological and Religious Environment

Cultural, Archaeological and Religious Environment

There are no known archaeological sites listed in the project area, although there is possibility of chance encounters with stone engravings, stellae, stone tools etc, in which case the appropriate bureau (Tourism and Culture) should be contacted for professional conservation and or recovery.

Summary of Identified Adverse Environmental Impacts:

- Soil Erosion, Sedimentation and Runoff. The existing intensive land use pattern already amplifies the impact.
- Slope Instability and Landscape Invasion
- Impact on soil and water quality - As there is high rainfall soil erosion and siltation problem in the area can be exacerbated
- Nuisance noise
- Air quality
- Impact on flora and fauna
- Impact on Property and Service Utilities
- Increased vulnerability for HIV/AIDS and STDs
- Social conflict
- Traffic safety

KONSO - YABELO

Total length of the project road is 107 km, of which the first 38.5 km (Konso - Brindar) is dry weather road with no drainage structures; while the remaining section (Brindar - Yabelo) is a gravel road. The road corridor is part of the Rift Valley Lakes Basin, which has diverse landforms.

Topographically, the project road starts at an altitude of 1350 masl (meters above sea level) and traverses through rolling and mountainous terrain for the first 16 km. It then traverses through rolling terrain up to Ch 25 km, after which the terrain is mostly flat up to Ch 70 km. The road section after Ch 70 km traverses through flat and rolling terrain up to Ch 88 km where the terrain changes to mountainous. The altitude reaches its highest level, 1950 masl, around Ch 92 km. After Ch 97 km the terrain becomes rolling up to Ch 101 km. The rest of the section to the end of the project traverses across flat terrain. Most of the streams have well defined canals and have stabilized through time. The route crosses a number of minor and major drainage areas. There are about 20 small and large bridges, 8 box culverts and about 80 pipe culverts. The largest rivers are Myra, Segen and Masgerada, located at Km 14, 18 and 52 respectively. All the streams except Segen are seasonal, flowing only during the rainy season. Most of them have flows for a short duration after the rains.

In general, soil erosion and siltation are major environmental problems in most parts of the project area. They are prominent in the section between Konso and Segen River mainly due to topography (sloping land), intensity of land use (more cultivation and less land cover), and intensity of rainfall. Natural drainage channels are mostly eroded on sloping areas and heavily silted in low-lying flat areas. Riverbank erosion and expansion is also a major problem, particularly along a major seasonal river crossing the road at Ch 16 km. Boulders, stones and sand transported by runoff water from the hills and mountains are deposited in gently sloping sections of the river course.

The intensity of soil erosion and siltation is less prominent in the section between Segen River and Elwoya except at a few spots and some river channels. This is simply by virtue of a mostly flat topography, good vegetation cover and less intensive land use. Of drainage channels intercepted by the road, Masgerdo River at approximately Ch 54 km has a major problem with bank erosion and silt accumulation. Soils in much of the corridor, notably in the section from Ch 26 km to Ch 38 km, are highly erodible, particularly where clearance of its vegetation cover and disturbance of the soil has occurred.
The section between Elwoya and Yabelo town has a major soil erosion and siltation problem. It is common to observe severe erosion in roadside ditches, diversion drains and along riverbanks. Along gentle slopes the cross and longitudinal drainage structures and natural drainage channels are heavily silted up. The erosion problem is primarily related to the geological nature of the soil, intensity of rainfall, topography and degradation of the vegetation cover due to clearance for cultivation, settlement and heavy grazing. The process of soil erosion can be exacerbated by the road due to runoff interception and concentration at drainage points. Scour protection measures have been constructed for some stretches of side drains in the hilly section before Yabelo.

Land-Use: The first 20 km of the road area is mainly used for agricultural activity. The Konso people are specially known for their traditional way of terrace farming on their hill side farmlands. The land is also covered with trees and bushes though it is not densely forested. After Ch 20 km the land cover generally changes to grassland with sparsely grown acacia type trees and bushes. The livelihood of the inhabitants along this stretch of the road is mainly based on cattle rearing and on some agricultural activities. From Ch 90 km the altitude rises gradually, and land use changes to agriculture again.

Climate: The climate of the Konso area is classified as tropical climate with mean annual rainfall varying between 500 mm and 1000 mm. As the road descends, the climate changes to the hot semi-arid condition with mean annual rainfall ranging from 400 mm to 800 mm.

Flora: The vegetation of the project areas predominantly comprises small trees and shrubs that are adapted to drought conditions by having either small deciduous leaves or leathery persistent ones, predominantly Acacia species followed by Commiphora species. There is also a high forestland along a small section of the Konso - Yabelo Road, on a mountainous area around Yabelo.

Ch 0 – 20km: Vegetation is predominantly open Acacia bushland and woodland. The vegetation is mostly disturbed due to widespread cultivation, livestock grazing and browsing, and human exploitation for construction materials and fuel wood. Hill slopes have better vegetation density while low-lying flat or gently sloping areas are mostly cultivated for sorghum production.

Ch 20 – 75km: Vegetation is predominantly Acacia-Commiphora bushland with Acacia woodland along some stretches. The vegetation cover is mostly dense except around Brindar and Elwoya villages and not much exploited except for livestock grazing and browsing. Vegetation clearance was observed only at and around the above-mentioned villages, and along some stretches of the road mainly for cultivation. In addition, some plots have been cleared for quarries and borrow pits to extract selected materials for the road construction. The intensity of livestock grazing in this area is much less, due to high prevalence.

Ch 75 km (Elwoya) – Ch 91 km: Acacia woodland and bushland predominate. Relatively large Acacia trees (A. tortilis and A. nilotica) occur in this part of the project area. Generally the size of the trees and shrubs increases towards Yabelo, which is primarily related to increase in elevation and rainfall. However, this part of the project area is more disturbed and exploited, particularly for rangeland. The human and animal population is higher than the preceding section. Cultivation is a dominant land use from Ch 75 – 78 and Ch 88 to 91 km. Ch 91 -100 km (Yabelo Town): This section of the road runs through a high forest, which is designated as Yabelo State Forest (Ch 91 – 98 km). It is located in a mountainous area surrounding Yabelo town at a relatively high altitude. Though it is scheduled as a protected forest, it is very disturbed and degraded due to extensive human influences, including settlements, exploitation of forest products and animal grazing. The dominant tree species in the forest is Juniperus procera, which is a highly demanded tree in Ethiopia for its superior quality for building construction.

Yabelo - End of the Project: This part of the project corridor is extensively used for cultivation and settlement, as a result of which little natural vegetation is remaining. Roadside planted trees (pepper tree) and living fence (Finger Euphorbia) are found along some stretches of the road. The project sites are also endowed with a rich diversity of grass species that are mostly growing both under and between the woody vegetation. The main grass species recorded from the project areas belong to the genera: Cenchrus, Eragrostis, Panicum, Eleusine, Aristida, Sporobolus, Bothriochloa, Cynodon, etc.

A previous study showed the presence of some forty-four threatened endemic plant species of the Acacia-Commiphora woodland vegetation type, which includes the vegetation of the project. Taking into consideration the agro-ecology and geographical location of the species, it is quite possible that some of these recorded or other threatened species can be found within the project areas. Considering the linear or localized nature of the impact areas, it can be assumed that losses will most likely be of numbers in individual species, not in species themselves. Thus, the loss is most likely not one of biodiversity.

Cultural Heritage
Currently in the study project premises the Konso Landscape inscribed by UNESCO as the 9th world heritage site of Ethiopia. The cultural properties constituting the Konso Cultural landscapes are:-

- The traditional stone walled towns ( Paleta) and their organization / and associated cultural properties that is the Kanta ( ward system): Mora (cultural space ) with its men house (pafta) Generation marker tree (Olayta). Erect stones (Daga-hela and Daga –DRIMA)
- The cultural landscape of Konso constitutes stone walled terraces that are evident along the Konso-Yabelo road segment towards the Konso side. These are spectacular living cultural traditions that stretch back to over 21 generations (400 years) and demonstrate the shared values, social cohesion and engineering knowledge of its communities to adapt to the hostile environment.
- The traditionally maintained groves (forest), which play an important role in Konso culture and serve as refuge for endemic plants.
- The burial marker statuettes (waka) , made of wood and unique to the Konso.
- The ponds (Harda), those are made with generations old knowledge and serve as response to the dry environment.

The UNESCO has made a buffer zone for these cultural heritages. The Konso – Yabelo road is a new boundary line and outside the formerly proposed buffer zone. This area has been removed from world heritage site due to previous disturbances to the site. However, project and ancillary works (material and access roads) should not disturb such a landscape. The contractor as well as the supervision consultant should be aware of these places and protect all terraces from damage as “No Go” areas although not listed as heritage in this context. They have values in protecting soil from erosion and stabilizing slopes. The regional Environmental Agency may suspend or stop the construction work if cultural heritage sites are encroached upon.

Fauna and Wildlife Habitats
The road project is located in areas designated as a kind of wild life conservation area. The Konso - Yabelo Road is mainly located within Borena Controlled Hunting Area (CHA). In practice, the wildlife reserve and controlled hunting areas have not received any development or management attention, and they only exist as ideas on paper, with no wildlife management facilities or activities. There are no personnel from wildlife conservation organizations permanently based in the Chas. Therefore, it appears that indiscriminate hunting by the local people for subsistence and trade together with habitat degradation has severely reduced wildlife numbers. The reduction of wildlife numbers is not only related to unsustainable off-take (harvesting) but is also due to migration to neighboring countries or more remote areas.
Along this road, the Segen Valley and the area between Brindar and Elwoyo have relatively important habitats and diverse wildlife. In particular, the region between Brindar (Km 38) and Elwoyo (Km 75) serves as an important migration route between the Segen Valley (Segen CHA) and Satire Plain, the latter being an important wildlife area in Teltele woreda, where one of the endangered species called Burchell’s Zebra is found.

The main wild animals observed, or indicated by the local people to be present in the road corridor include Burchell’s Zebra, Greater Kudu, Dik-dik, Bushbuck, Oribi, Klipspringer, Gerenuk, Hyena and Baboon. Some wild animals like Lesser Kudu and Oryx, which used to live in the area, have migrated to Satire due to human influences, especially hunting. Among the wild animals, Burchell’s Zebra are the main wildlife that seasonally move between Gelana/Segen Valley and Satire. In the dry season they migrate from Satire to Segen in search of water and better grazing pasture, and come back in the wet season when water and fresh grass are available.

The project area is also rich in bird-life, though its species composition is not yet well studied. About 194 bird species, including three endemic ones, have been identified from the Ya belo Wildlife Sanctuary, which is very close to the project road. Among the bird species observed are Vulturine Guineafowl, Francolin, and White-tailed Swan; the latter being endemic to Ethiopia. Two other endemic birds, namely Ethiopian Bush Crow and Prince Ruspoli’s Touraco which are found in Yabelo Wildlife Sanctuary, might be present in the road corridor, especially in the Yabelo State Forest. Several species of other animal groups including reptiles and amphibians are also found in the area.

Concerning the impacts on rare fauna, there is little information on endemic or rare species in or around the project area. None of the large endemic mammals has been reported to be present in the areas to date. Three endemic bird species were recorded from the Yabelo Sanctuary. These and other endemic animal species including rare ones can be found in the project area. However, it is unlikely that there would be a significant impact on the diversity of fauna due to implementation of the project road.

Social and Economic Environment

The total population of the Woredas crossed by the project road is estimated to be about 431,023 in 2009. The rural population accounts for about 94% of the total. Average family size is estimated to be in the range of 5-6 persons per household. The population density, on average, is about 23 persons per square km. The indigenous people belong to either the Konso or Oromo ethnic groups. Livestock keeping is the mainstream of the local pastoral economy of the Oromo. The Konso people are basically mixed farmers. Annual food crop production within the zone of impact amounts to about 50% of annual food requirements for the rural population alone. The remainder comes from livestock products, market purchase and/or exchange of food grains for live animals. Average cropland cultivated by an individual farm family per head is estimated to be 0.5 ha. Social facilities and services are, in general terms, poorly developed and used.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:

For each of the road corridors, expected indirect and/or long term impacts include:

- Dust and noise pollution during construction activities
- Traffic management and safety issues during construction
- Increased traffic speeds and possible safety issues after completion
- Potential loss of trees and shrubs along the widened corridors, at borrow and quarry sites, at spoil areas, along side-tracks for detours and haul roads
- Demolishing and re-settlement of houses and buildings that are being used either for residential or business purposes.
- Improvements in horizontal and vertical curves, widening of the road width, provision of shoulders, provision of parking lanes and pedestrian walkways in towns and villages, new drainage structures and replacement of substandard structures, proper side ditches and erosion protection structures, and asphalt pavements, expected to provide benefits in terms of environmental protection and road and traffic safety issues after construction, including reduction in dust nuisance, reduction of erosion from roadside ditches and diversion drains, and reduction of sedimentation of rivers and streams and impacts on water quality. In addition, it is likely to improve sight distance/visibility for drivers and pedestrians, which in turn will reduce accident risks for both motorized and non-motorized traffic, and facilitate traffic flows. Moreover, it will bring better safety for pedestrians and non-motorized vehicles in relation to provision of pedestrian walkways and parking lanes in town and village sections.
- The expansion of road and transport services in the project area will promote accelerated and sustainable agricultural development in the project area, improving market opportunities for the sale of agricultural products and consumer goods.

Overall, the upgrading of the proposed roads have not identified environmental impacts that cannot be mitigated by use of good engineering practices integrated with the defined environmental and social mitigation measures identified in the ESIAs and RAPs, which will be managed during project execution through Site-based Environmental Management Plans and appropriate technical specifications and contract documentation.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

**AMBO - WELISO:**

The road will be upgraded following the existing alignment, except for minor alignment deviations aimed at improving road geometry and road safety.

**DEBRE BIRHAN - ANKÖBER:**

The proposed road route follows the existing alignment Minor re-alignments have been made to suit the geometric design requirements and to protect some environmentally sensitive sites. It is proposed to consider re-alignment of the route to protect the land slide prone and heritage sites around St. Michael church up to the gate to the palace (Ch 41 – 43 km).

**KOMBOLCHA - BATI -MILLE**

Two engineering alternatives were considered, both follow the existing road alignment. Alternative 1 is following the existing road without improving the existing geometry and without increasing the road width. Adoption of this option would minimize additional land requirement and reduce a number of environmental and social impacts like loss of agricultural lands, intrusion in landscape/impacts on landscape quality, potential slope stability problem, soil erosion and sedimentation related to earthwork activities, and loss of roadside trees and other vegetation. On the other hand, maintaining the substandard radii would have significant adverse safety impacts. Alternative 2 is upgrading the existing road but improving the existing geometry. Under this alternative, the road would be upgraded by improving most of the substandard radii to the minimum requirements. Adoption of this option would involve acquisition of additional land and may result in some environmental and social impacts including loss of lands under agricultural activities, negative impacts on landscape quality/visual pollution, slope destabilization, increased sedimentation in water courses, loss of roadside trees, and damages to irrigation canals and other water conveyance structures.
Conversely, it has a number of major benefits including improved traffic safety and better traffic speeds.

MIZAN - DIMA:
Four potential routes were assessed for environmental impacts. Route 1 was selected as the preferred alignment as having the least environmental and social impacts. Route 4 passes through the Kibish area Kibish Geological Formation known for fossils of archeological and pale-archeological significance, and was not selected due to the potential archeological impacts. Routes 2 and 3 had intermediate impacts.

KONSO - YABLELO:
Out of the assessed five options, the consultant recommended three of them for further investigation. These are:
- Realigning the existing alignment starting from Ch 74.1 to 75.1 km. This realignment was proposed to avoid water course flowing parallel and near the alignment and to provide a better crossing location. However, from the environmental point of view, this option would cause adverse impacts on the existing vegetation cover and farm land. The anticipated problem, which is the expanding of water course towards the existing road is not severe and can be mitigated by applying appropriate engineering solutions and stream bank stabilization through grassing and tree plantation. Therefore, instead of realigning we recommend the road to follow the existing route.
- Realigning the existing alignment from station Ch 75.1 to Ch 77.5 km. This realignment was proposed to avoid prominent erosion problem. As it was observed during the field visit, the existing erosion problem can be mitigated by applying appropriate soil conservation measures such as terracing and tree plantation. The soil and landscape of the proposed realignment section is also sensitive for erosion with easily erodible soil. Therefore, from the socio-environmental and economic points of view, it would be better to follow the existing route than realigning.
- Following the existing alignment was determined as the soundest option. Due lower costs and more socially acceptable to adopt the present routes as they will serve the already established villages and social services, and promote the socio-economic development and improvement of the area. It is also advantageous in terms of environmental consequences, because upgrading of existing road will cause much less severe environmental effects than with new road.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

ERA and RoW agencies in the regions will be responsible to supervise the implementation of the RAPs and EMPs. ERA will develop contract documentation for each project to prepare Environmental and Social Management Plans (ESMP) that are responsive to the findings of the ESIA’s and RAPs, and will ensure that all prohibitions and mitigation measures that are identified in the ESIA’s are complied with.

The ESMP will include all the mitigation and monitoring measures to be applied during the construction activities, together with the timeframe required for implementation. They will set-out the main environmental and social impacts, key corresponding mitigations, offset or compensation measures, recommended time framework for implementation of the mitigation measures, organizations/parties responsible for implementation of the mitigation plan, organizations/parties responsible for monitoring of the proper implementation of the mitigation plan, and where necessary, cost estimate of the mitigation plan.

Environmental and social monitoring will be required both during the implementation and operation phases of the project to ensure the proper implementation of the EMPs and RAPs. Environmental monitoring helps to detect the scale and extent of impacts caused by the project over time and to assess whether mitigation actions have been properly and timely implemented and are working as expected. Monitoring of environmental parameters will identify potential problems from the road development activities and will allow for prompt implementation of effective corrective measures. Details of the recommended environmental monitoring program (issues, indicators and parameters) are provided in the ESIA’s.

To ensure implementation, it will be essential that the proposed mitigation measures will be considered during the detailed engineering design and included in the specifications of the tender documentation. In addition, adequate budget shall be allocated by ERA to implement the RAPs ahead of the construction phase. The Contractor will be required to manage the project in accordance with the ESMP, the Supervising Engineer (which will include environmental and social experts) will be required to ensure that the ESMP it is properly implemented, and inform ERA where there are gaps and recommend actions need to be taken to ensure the Contractor complies with his contractual obligations in this respect.

Further, ERA will undertake a well-planned audit program to follow up the proper implementation of the EMP and RAP recommendations and their effectiveness, as well as identify any unforeseen issues.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

The key stakeholders for the projects are the impacted communities, the Right of Way Agencies (RoW), ERA and the Woreda Administrations. All the communities, including the implementing agencies and the Woreda administrations in all the woredas that the roads traverse have been actively consulted during the preparation of the ESIA and the RAPs. The information regarding the projects was widely shared with the larger community along the roads prior to seeking input and concerns. Generally all communities are highly supportive and positive about the construction of the proposed road projects and are satisfied with the plans. The impacted communities and the woreda administrations reached consensus on the following:
- All the woredas, traversed by the proposed road projects have agreed to provide replacement land for the relocation of affected persons
- Support and assistance for people who will lose their land (farmland or residential land) for the construction of the right of way, and other construction purposes
- The woreda officials have agreed to contribute their effort in reducing and mitigating the expected potential negative impacts of the project and in enhancing the positive expectations,
- Special support will be made by the woredas and the community for female headed households, elderly and other socially disadvantaged groups if affected by the construction of the proposed road projects
- Assured the smooth implementation of the construction works and to provide other routine administrative support as and when needed
- Facilitate the employment of labour force from the localities
- The woreda administrators shall provide sites and sources for construction materials, such as, rocks, gravel, sand, water and others that may be required during construction
• The administration shall maintain the peace and security of the project area for the smooth completion of the project,
• Dissemination of information to the local community.

The local administrators consulted confirmed that, from a socio-economic benefit point of view, the project is a high priority issue in their respective communities. It will have considerable benefit for socio-economic development of the surrounding areas and it will solve transportation and communication problems that occur in the absence of continuous maintenance. All the local administrations have indicated that they would play an active role during the construction and operation period of the project.

The ESIAs and the executive summaries of the RAPs will be translated in the respective local languages and disclosed regionally at the kebeles that the roads traverses prior to project appraisal. The full RAPs will be disclosed and made available to the public at the Woreda administration that the roads traverse. The kebele administration will inform the impacted communities at the Idir meetings of the availability of the RAP summary and the full RAP at the kebele and woreda administrations. The Summary of the RAPs will include the contact information of the safeguards focal person at ERA and RoW agencies.

B. Disclosure Requirements Date

<table>
<thead>
<tr>
<th>Environmental Assessment/Audit/Management Plan/Other</th>
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<tbody>
<tr>
<td>Date of receipt by the Bank</td>
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<tr>
<td>Date of &quot;in-country&quot; disclosure</td>
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<tr>
<td>Date of submission to InfoShop</td>
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For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors

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<tr>
<th>Resettlement Action Plan/Framework/Policy Process</th>
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If the project triggers the Pest Management and/or Physical Cultural Resources policies, the respective issues are to be addressed and disclosed as part of the Environmental Assessment/Audit/or EMP.

If in-country disclosure of any of the above documents is not expected, please explain why:

Note: Receipt an disclosure of the ESIA's and RAP's were done progressively for each of the five road projects. The dates indicated refer to the final date on which the last of the documents were received and/or disclosed.

C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting)

<table>
<thead>
<tr>
<th>OP/BP/GP 4.01 - Environment Assessment</th>
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<tbody>
<tr>
<td>Are the cost and the accountabilities for the EMP incorporated in the credit/loan?</td>
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<tr>
<th>OP/BP 4.04 - Natural Habitats</th>
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<tr>
<td>If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?</td>
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<tr>
<th>OP/BP 4.11 - Physical Cultural Resources</th>
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<tr>
<td>Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?</td>
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<tr>
<th>OP/BP 4.12 - Involuntary Resettlement</th>
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<td>If yes, then did the Regional unit responsible for safeguards or Sector Manager review the plan?</td>
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<tr>
<th>OP/BP 4.36 - Forests</th>
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<tr>
<td>Does the project finance commercial harvesting, and if so, does it include provisions for certification system?</td>
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The World Bank Policy on Disclosure of Information

| Have relevant safeguard policies documents been sent to the World Bank’s InfoShop? | Yes [X] No [ ] NA [ ] |

| Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs? | Yes [X] No [ ] NA [ ] |

All Safeguard Policies

| Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies? | Yes [X] No [ ] NA [ ] |

| Have costs related to safeguard policy measures been included in the project cost? | Yes [X] No [ ] NA [ ] |

| Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies? | Yes [X] No [ ] NA [ ] |

<p>| Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents? | Yes [X] No [ ] NA [ ] |</p>
<table>
<thead>
<tr>
<th>Task Team Leader:</th>
<th>Fiona J Collin</th>
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<tr>
<td><strong>Approved By:</strong></td>
<td></td>
</tr>
<tr>
<td>Regional Safeguards Coordinator:</td>
<td>Name: Alexandra C. Bezeredi (RSA) Date: 11-Jun-2012</td>
</tr>
<tr>
<td>Sector Manager:</td>
<td>Name: Supee Teravaninthorn (SM) Date: 14-Jun-2012</td>
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