PROJECT: CONSTRUCTION AND ASPHALTING OF THE DEDOUGOU-TOUGAN AND KONGOUSSI-DJIBO ROADS

COUNTRY: BURKINA FASO

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) SUMMARY

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SUMMARY OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Project Name : Project for the Construction and Asphalting of the Dedougou-Tougan and Kongoussi-Djibo Roads

Project No.: P-BF-DB0-017

Country : Burkina Faso

Department : OITC

Division: OITC-1

1. Introduction

This document presents a summary of the Environmental and Social Impact Assessment (ESIA) of the Project for the Construction and Asphalting of the Dedougou-Tougan and Kongoussi-Djibo Roads. This summary has been prepared in accordance with the environmental and social assessment guidelines and procedures of the African Development Bank (AfDB) for Category I projects. This project has been categorized on the basis of the cumulative impacts of the two roads. However, and in order to comply with national procedures, separate environmental and social impact assessments have been conducted for each road section. This summary is a synthesis of these assessments.

First, the project’s description and rationale are presented, followed by Burkina Faso’s legal and institutional framework. A brief description of the main environmental conditions of the project area is presented for each section through its physical, biological and human components, the options and alternatives are compared in terms of technical, economic, environmental and social feasibility including the concerns of the population. Then, the most significant impacts on the biophysical and human (socio-economic) environments are presented. The proposed optimization and mitigation measures are presented to increase the benefits and/or prevent, minimize, mitigate or offset the negative impacts, as well as the monitoring programme. The public consultations held are presented as well as complementary project-related initiatives.

2. Project Description and Rationale

The project consists of the construction and asphalting of national highways no. 10 between Dedougou and Tougan, and no. 22 between Kongoussi and Djibo both of which are internal access roads. They are seriously degraded earth roads which are not easily passable year-round, whereas the sections upstream towards Ouagadougou are asphalted and in good condition (except the Koudougou-Dedougou section which is being asphalted). The project comprises the following components:

A. Construction and Asphalting of Roads: this component consists of: (i) the construction and asphalting of the Dedougou-Tougan (91 km) and Kongoussi-Djibo (96 km) roads; (ii) construction work monitoring; (ii) implementation of environmental impact mitigation measures; and (iv) sensitization on STI/HIV-AIDS, environmental protection, road safety and overloading of heavy vehicles.
B. **Related Improvements**: to enhance the project’s socio-economic impact, it is planned to: (i) improve feeder roads to the main highways in order to facilitate the PIA population’s access to domestic markets and basic social infrastructure; (ii) implement labour intensive, stone-paved road works in Dedougou, Gassan, Tougan, Kongoussi and Djibo districts, in order to stimulate job creation for young people; (iii) rehabilitate cattle tracks along the Kongoussi-Djibo road to prevent animals from crossing it and enhance user safety; (iv) drill boreholes and construct watering troughs and reservoirs; (v) provide support to women so as to promote their self-reliance (multi-functional platforms, dairy product processing equipment, warrantage warehouse etc.); and (vi) ensure works control and monitoring.

C. **Institutional Support**: the weaknesses observed in implementing road projects (design, works, contract award and management) underscore the need to effectively build the technical capacity of DGR and DMP staff to enable them to perform their duties efficiently, especially monitoring the conduct of studies, works supervision, procurement and site management. To that end, it is proposed to provide support under the project for: (i) technical training to enhance the quality of project design and implementation monitoring, and training in Bank’s environmental and social safeguards measures as well as in AfDB’s procurement procedures; (ii) the procurement of IT and reprographic equipment; (iii) support to establish an adequate archiving system; and (iv) the conduct of road studies.

D. **Project Management**: this component comprises: (i) support to the operation of the project management unit; (ii) monitoring/evaluation of the socio-economic impact; (iii) monitoring of ESMP implementation by the National Environmental Assessment Authority; (iv) technical assistance for procurement; and (v) technical, road safety, accounting and financial audits.

The project is in keeping with the overall framework of Burkina Faso’s National Transport Sector Strategy. This strategy aims to open up the country both internally and externally by prioritizing areas with high production potential and connections to the main corridors. It also aims to bring down transport costs both within the country and for international trade, and ensure minimum accessibility to all of the country’s regions year-round in complete security.

3. **Political, Legal and Administrative Framework**

3.1 **For Burkina Faso**


The institutional framework relating to the environment is underpinned by the Constitution promulgated on 11 June 1991 in Burkina Faso, which enshrines the principle of environmental protection as a fundamental duty of the State and the entire nation. This institutional framework for environmental governance revolves around three main actors: (i) the State and its agencies, especially the Ministry of Environment and Sustainable Development as well as other Ministerial Departments, administrative divisions (provinces, districts, villages); (ii) local communities, which are gradually growing in importance; and (iii) users (private sector, civil society).

3.2 For the African Development Bank (AfDB)

The main protection policies of the African Development Bank (AfDB) applicable to the project are: (i) Guidelines of the Handbook on Stakeholder Consultation and Participation in AfDB Operations; (ii) Policy and Guidelines on Cooperation with Civil Society Organizations; (iii) African Development Bank’s environmental and social assessment procedures for public sector operations; (iv) all the Annexes to ESIA procedures for AfDB public sector operations; (v) Gender Policy, 2001 (vii) Information Disclosure Policy, 2005; and (viii) Policy on the Environment, 2004.

3. Description of the Project’s Environment

3.1 Biophysical Environment

3.1.1 Dedougou-Tougan

Climate: the project impact area is characterized by a tropical climate of the Sudano-Sahelian type with, however, two variants: (i) the South Sahelian sector in the North with average annual rainfall of 500 to 700 mm covers Sourou Province; and (ii) the Sudanian sector in the Centre, with average annual rainfall of 700 to 900 mm covers Nayala and Mouhoun Provinces.

Geology: the section is located on the Precambrian A formation composed of Sotuba rocks from Dedougou to Diouroum, from where the Precambrian D geological formation is to be found, composed of undifferentiated migmatites and granites that constitute the road’s substratum and extend as far as Tougan.

Soils: there are four types of soil: (i) slightly eroded gravelly soils, with a general sandy texture and a very rough surface with many concretions; (ii) vertic, eutrophic brown soils. These soils developed from rich basic materials display shrinkage cracks, a clayey texture on the surface and pressure facies on the aggregates; and (iii) hydromorphic mineral pseudo-gley soil on materials with different textures. These are soils waterlogged on the surface or across the profile with a high water retention capacity.

Hydrography and Water Resources: The project area is drained by the Mouhoun (formerly the Black Volta), a permanent water course which flows across about 860 km of the country. Small rivers, streams and marshlands have limited flow rates in rainy season.
have been affected by the construction of dams usually associated with irrigation schemes. These include the dam on the Sourou (a tributary of the Mouhoun), which is one of the biggest developments and is permanently filled with water. The bedrock aquifer systems usually comprise three horizons with flowing water. These are: (i) the lateritic crust; (ii) furrowed clays; and (iii) the fractured fringe of the substratum (bedrock).

**Flora and Fauna:** The characteristic ecosystems of the area are woody, tree and shrub savannahs. They come from the transformation of plant formations of the open forest type as a result of adverse climatic phenomena and human occupation. The residual plant formations comprise average-size trees: *Afzelia africana*, *Vitellaria paradoxa*, *Acacia seyal*, *Acacia senegal*, *Balanites aegyptiaca*, *Zizyphus mauritiana*, *Anogeissus leiocarpus*, etc. Most of the wildlife exists in the Sâ and Sourou classified forests. Large animals (elephants, roan antelopes, etc.) have now disappeared from the project’s direct impact area and only small wildlife remains. No critical habitat has been observed or reported in the project area by local technical services or communities.

3.1.2 Kongoussi-Djibo

**Climate:** Rainfall in the Sahel area varies between 300 and 600 mm. In the Centre-North, rainfall ranges from 600 to 750 mm. Average temperatures observed in the Centre-North region fluctuate between a minimum of 17.7°C during December and January and a maximum of 40°C for March and April. Temperatures are generally high. The annual average is about 28°C. The hottest months are April and May (40-41°C) and the lowest temperatures are recorded in January (13°C).

**Geology:** The project area is characterized by two main types of geological formations; undifferentiated migmatites and granites and sedimentary rocks. The undifferentiated migmatites and granites are crystalline rocks formed during the pre-birrimian period and represent about 95% of the project area. The sedimentary rocks are formations composed mainly of birrimian hills and occupy about 5% of the area’s substratum.

**Soils:** There are several types of soils in the project area: (i) slightly eroded gravelly soils which cover about 40% of Bam Province and about 30% of Soum Province; (ii) hydromorphic soils; (iii) leached ferruginous tropical soils with concretions; (iv) hydromorphic sodic soils; (v) brown subarid soils; and (vi) encrusted lithosols.

**Hydrography:** With regard to hydrography, Bam Province is located in the Nakambe national watershed. The nearest water points to the project road include Lakes Bam and Bourzanga. The two lakes are less than 1 km from the road at some points, especially where it crosses the villages of Tamponga, Kourpélé and Yargo for the first lake, and Bourzanga for the second. Soum Province is mainly located in the Béli watershed.

**Flora and Fauna:** Vegetation in the project area mainly comprises shrub steppes, tree steppes, shrub to wooded savannah and gallery forests along water courses and ponds. The herbaceous vegetation is mainly composed of annual grasses. In general, the Sahel region is an area of thorny steppes, i.e. a herbaceous formation in which the grasses have xeromorphic characteristics. This type of vegetation represents a transition zone between the Sahelo-Sudanian savannahs characterized by Andropogoneae and Combretaceae located further south.
3.2 Human Environment

Dedougou-Tougan

For the three (03) provinces concerned by the road asphalting project (Mouhoun, Nayala, Sourou), annual population sizes in 2006 were respectively 297,350, 220,622 and 163,433 inhabitants, i.e. a total representing 47.22% of the regional population. The total population of the project area comprises 406,245 men and 412,139 women. For the whole region, the school-age population (3-24 years of age) represented 72% of the total population.

Kongoussi-Djibo

Two (02) provinces (Bam and Soum) are concerned by the project to construct and asphalt the section. The 16 localities crossed by the road are spread over 4 districts (“départements”). The population of the area directly crossed by the project section for the four districts was 132,562 in 2006 and estimated at 201,711 in 2012.

The household living condition surveys (2010) show that the proportion of the population with low income dropped from 46% in 2003 to 44% in 2010. However, 50% of rural households are living below the poverty line. According to the same sources, the poverty prevalence rate in the PIA is estimated at 56% in the Mouhoun River Loop, 32% for the Centre-North region and 37% for the Sahel region. The remoteness and difficulty of access due to road conditions are among the explanatory factors for the high poverty prevalence rate in the Mouhoun Loop, once considered as Burkina Faso’s granary. The area’s economy is dominated by mixed farming activities. The Djibo area is the country’s leading stockbreeding region. Women in this area are highly involved in the processing of dairy products, but they lack adequate equipment to keep the products fresh and prevent losses. Market gardening is practiced throughout the PIA. It is often handicapped by a shortage of water during the dry season.

4. Project Alternative Solutions

<table>
<thead>
<tr>
<th></th>
<th>Option 1: Without the Project</th>
<th>Option 2: asphalting the section by retaining 100% of the present configuration</th>
<th>Option 3: asphalting and retaining 99% of the present configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dedougou-Tougan</strong></td>
<td>From an environmental standpoint, this option has a negative impact since it creates a lot of dust which deteriorates air quality. Its economic and social impact is negative since it affects the area’s accessibility, increases insecurity for users (accidents), limits access by local residents to social facilities, increases road and vehicle maintenance costs and lengthens users’ journey times, etc.</td>
<td>From an economic standpoint, this option is beneficial because it helps to reduce project implementation costs. However, from the social and environmental standpoint, it does not guarantee safety at certain crossings, especially the Mouhoun bridge.</td>
<td>This entails adhering to 99% of the existing configuration with possible modifications, in particular, to the right of the Mouhoun bridge to prevent the destruction of houses in the fishermen’s village, improve user safety by avoiding a sinusoidal configuration and not undermine the integrity of the classified forest, located to the left of the road (Dedougou –Tougan direction).</td>
</tr>
<tr>
<td><strong>Kongoussi-Djibo</strong></td>
<td></td>
<td></td>
<td>This entails adhering to 99% of the existing configuration and shifting it slightly to the left at the level of the sacred termite hills and providing protective perimeter fencing for the work site, in collaboration with the customary authorities (Kongoussi –Djibo direction).</td>
</tr>
</tbody>
</table>
5. Potential Impacts, Mitigation and Optimization Measures

5.1 Negative Impacts

**Site Preparation Phase:** During the site installation phase, the main project impacts will be: (i) temporary disruptions to traffic and trading activities; and (ii) the felling of about 2000 trees on the two sections.

**Construction Phase:** The main negative impacts will be: (i) mobility of persons and goods will be disrupted during the works; (ii) risk of quantitative and qualitative degradation of water resources; (iii) risks of accidents related to the movement of machines and site vehicles; (iv) risks of profanation/degradation of sacred, cultural sites; (v) risk of air and acoustic pollution from the noise of machines, vibrations, emission of exhaust fumes and dust particles; (vi) risk of soil erosion in the borrow areas and works on existing water courses; (vii) risk of soil and water pollution related to poor management of site waste and hydrocarbons; and (vi) risk of spreading STI and HIV/AIDS.

**Operational Phase:** Sound and air pollution as well as accident risks will be exacerbated by the combined action of more vehicles using the road as well as the closer proximity of local residents and trading activities. Accident-related risks will be even higher in localities where public places (markets, schools, health centres, etc.) are located by the roadside.

5.1 Positive Impacts

The main expected positive impacts are: (i) improvement of the living conditions of people living in the project area; (ii) facilitation of access to socio-economic facilities; (iii) contribution to increased trade and development of mixed farming activities; (iv) job creation for young people; (v) increased economic self-reliance for women through multi-functional platforms; and (vi) capacity building for actors through training courses. Overall, the project will contribute to poverty reduction and the improvement of the living environment and conditions of the urban and rural population within the PIA.

6. Alleviation and Mitigation Measures before and during the Construction Phase.

**Site Preparation Phase:** It is recommended that the works contractor recruit for its own account an environmental and social officer during the works phase. At works start-up, it shall also provide a Site Environmental Protection Plan (SEPP) and an Environmental Quality Assurance Plan (EQAP) for overall site management. The SEPP and EQAP shall indicate: (i) working methods incorporating the transport of materials with a view to reducing nuisances to the human environment (safety, noise, road traffic and accident risk); (ii) resources deployed to mitigate the impacts on the natural environment and prevent accidental degradation. Furthermore, regarding the borrow sites and quarries, each site, in accordance with the Mining Code, will be the subject of an environmental assessment note accompanied by a site restoration plan for submission to the project owner and the Ministry of Environment for issuance of a Notice of Compliance. To ensure environmental mainstreaming as far upstream as possible in the bidding procedures, the specifications intended for contractors will incorporate environmental requirements and the objectives to be achieved in the special technical specifications.
**Works Phase:** (i) the planting of over 13 000 trees (school woodlots and row plantations). Species have been proposed but the final selection will be made together with the population of the localities concerned and the specialized NGO in charge of planting; (ii) realignment of the road to the right of the Mouhoun bridge to avoid the classified forest and houses on the Dedougou-Tougan sector; (iii) prevent the profanation/destruction of all the sacred/cultural sites along the road by slightly realigning the layout of the existing road and/or protecting those sites closest to the road on both sections; (iv) construction of 34 boreholes (18 on Kongoussi-Djibo and 16 on Dedougou-Tougan) to improve the availability of water resources and monitor the quality of the said resources. This measure will help to ease pressure on surface water resources and limit potential conflicts among users. On works completion, these boreholes will be transferred to the communities who will operate them through local water user committees; and (v) sensitization of communities and contractors’ personnel on protection against STI and HIV/AIDS, road safety and environmental protection. Related improvements and optimization measures are also planned under the project (see the section on complementary initiatives).

Other environmental protection and safety measures are: (i) recovery of oil, grease and lubricants in containers and their management in compliance with environmental standards and requirements in force; (ii) control of the vehicles of the contractor and its personnel; (iii) periodic emptying and cleaning of these structures; (iv) requirement to carry out all vehicle refuelling, maintenance and oil change operations on the purpose-built site; (v) regular watering of the carriageway, the earthwork areas and quarry ramps near houses, in the event of excessive dust emissions; (vi) adequate signalling in works areas; (vii) prior identification and replacement of installations (networks, public taps, standpipes and generators) likely to be damaged; (viii) control of the restoration of local residents’ access roads and goods affected by the works; (ix) sensitization of workers on compliance with regulations on forest and fishery resources and wildlife; (x) periodic sanitary inspections of personnel and their safety gear (helmets, gloves, shoes, hearing protection for machine operators; (xi) encouragement to favour local recruitment during works and subcontracting to local firms (sand extraction, small structures); and (xii) permanent maintenance of the smooth drainage of run-off water to prevent flooding of houses when crossing urban areas, etc.

7. **Environmental Risk Management**

The environmental risk will mainly concern the accidental spillage of hydrocarbons, bituminous products, explosive products and other substances used in the road construction. Risk of accidents could also occur both on the work sites near water courses as well as cases of fires for which safety and training measures are planned with the competent services. These measures concern: sensitization and training of site workers and ad hoc teams in rapid response techniques in the event of disasters, safety measures to be complied with in dangerous or risky areas, sensitization of local residents regarding the prevention of health risks and road safety.

Other technical measures concern the construction of secure maintenance areas for trucks for the storage of polluting products to prevent any accidental spillage that might contaminate natural resources. On-site measures will be taken to ensure satisfactory retention around fuel, oil and bitumen storage tanks and also to dig ditches to evacuate oils, grease and other polluting liquids from the maintenance workshops, vehicle and equipment cleaning facilities and loading areas. With regard to explosives management, safety measures will be taken as set out in the provisions of Burkina Faso’s Environment Code. Safety and prevention measures will also be implemented and maintained to prevent specific risks related to road traffic, traffic accidents, first aid, communication and evacuation.
The resident engineer will ensure compliance with speed limits for all site vehicles in order to contain the traffic-related risks. The other measures include road diversions and use of retro-reflecting devices to protect the lives of people and animals. Monitoring will fall within the remit of the Environmental Protection Agency. The contractor shall see to the proper maintenance of all the vehicles and equipment to reduce noise and emission of diesel exhaust particles.

8. Monitoring Programme and Institutional Responsibilities

8.1 Monitoring Team and Institutional Arrangements

Control and implementation will be mainly carried out by a consulting firm with the support of some actors, in particular, the police services regarding speed limits; the water services regarding the use of local water sources; the Mines and Geology services regarding the opening, operation and management of quarries. Representatives of the local communities as well as the environment, health and safety technical services could also participate in the supervision. The consulting firm responsible for control shall indicate in writing (compliance or non-compliance sheets) the actions for the implementation of environmental measures, their status and execution in compliance with existing standards.

In addition to the activities of the control mission and those of the contractor, monitoring of environmental and social issues will be carried out by an environmentalist who is a member of the project management unit at the General Directorate of Roads and supervision missions by the environmental and social management service of the Ministry of Infrastructure, Transport and Disenclavement.

A partnership agreement will also be concluded with the National Environmental Assessment Authority (BUNEE) of the Ministry of Environment to strengthen the project’s environmental and social monitoring. The monitoring ToRs have already been prepared to this end and the following table indicates the reporting schedule to be adhered to by BUNEE.

Table 1
Schedule for the Submission of Reports on the Monitoring of ESMP Implementation

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Format (number)</th>
<th>Submission Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review reports on documents submitted for consideration (SEPP, EQAP, etc.)</td>
<td>Electronic CD (3)</td>
<td>Within 7 days of receipt of documents</td>
</tr>
<tr>
<td>2</td>
<td>Review reports on impact notes submitted for consideration by BUNEE,</td>
<td>Electronic CD (3)</td>
<td>Within 15 days of receipt of documents</td>
</tr>
<tr>
<td>3</td>
<td>Bi-monthly monitoring report on implementation of project ESMP</td>
<td>Electronic CD (3)</td>
<td>15 days on the due date</td>
</tr>
<tr>
<td>4</td>
<td>Environmental feasibility opinions on borrow sites, base camps and quarries</td>
<td>Electronic CD (3)</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Final monitoring report on implementation of the agreement</td>
<td>Paper (5) Electronic CD (3)</td>
<td>30 days after contract completion</td>
</tr>
</tbody>
</table>

8.2 Responsibilities

Implementation of the environmental management programme shall be the responsibility of the following institutions: (i) the ESMP implementation team (successful works contractor); (ii) environmental expert of the control firm; (iii) the project monitoring and implementation unit at the MTTD; and (iv) BUNEE and regional environment officials.
To capitalize on this first experience, this contract will also include the preparation of a handbook for the environmental monitoring of road projects.

8.5 *Estimated Cost*

Details of the costs corresponding to the implementation of the ESMP measures are presented in the following Table.

### Table 2
*Estimated Cost of ESMP Measures*

<table>
<thead>
<tr>
<th>Activities</th>
<th>Cost (CFAF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost of environmental and social measures</td>
<td>114,600,000</td>
</tr>
<tr>
<td>Support to the training of officials from the Ministry of Infrastructure and Environment on the Bank’s environmental and social protection procedures</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Monitoring of ESMP implementation by BUNEE (lump sum)</td>
<td>20,000,000</td>
</tr>
<tr>
<td>Preparation and publication of a handbook on the environmental monitoring of road projects (as part of the capitalization on the BUNEE mission’s experience)</td>
<td>12,000,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>156,600,000</strong></td>
</tr>
</tbody>
</table>

*Source: Study Reports*

8.3 *ESMP Monitoring and Indicators*

### Table 3
*ESMP Monitoring and Indicators*

<table>
<thead>
<tr>
<th>Monitoring Action</th>
<th>Monitoring Parameter</th>
<th>Monitoring Indicator</th>
<th>Intervention Period</th>
<th>Monitoring Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verify the effective inclusion of environmental and social clauses in the specifications.</td>
<td>Exhaustiveness and quality of environmental and social clauses</td>
<td>Appropriate clauses taken into consideration</td>
<td>Prior to contract signature</td>
<td>Once</td>
</tr>
<tr>
<td>Validate the Site Environmental Protection Plan (SEPP) and the Environmental Quality Assurance Plan (EQAP)</td>
<td>Quality of SEPP and EQAP</td>
<td>SEPP and EQAP validated</td>
<td>Prior to works start-up</td>
<td>Once</td>
</tr>
<tr>
<td><strong>Works Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ensure the appropriate management of wood forest products in accordance with the ESMP</td>
<td>Wood products management method</td>
<td>Destination of wood products</td>
<td>During clearing</td>
<td>As required</td>
</tr>
<tr>
<td>Verify that the mitigation measures on air pollution by dust are effective</td>
<td>Implementation of mitigation measures</td>
<td>Frequency of watering</td>
<td>Throughout the entire works phase</td>
<td>Bi-monthly and as required</td>
</tr>
<tr>
<td>Verify the implementation of hygiene, safety and health measures on site as well as the site internal rules</td>
<td>Implementation of hygiene, safety and health measures</td>
<td>Presence and use of IP and emergency assistance kit. Presence of speed bumps and/or speed limit signs</td>
<td>Throughout the entire works phase</td>
<td>Continuous</td>
</tr>
<tr>
<td>Ensure compliance of site waste (solid and liquid) management with internal rules of the site and waste treatment and recycling centre</td>
<td>Implementation of soil and water protection measures</td>
<td>Existence of solid and liquid waste management systems and their operation</td>
<td>Throughout the entire works phase</td>
<td>Continuous</td>
</tr>
<tr>
<td>Ensure the population’s well-being with regard to noise nuisance</td>
<td>Quality of living</td>
<td>Number of complaints</td>
<td>During works phase</td>
<td>Continuous</td>
</tr>
<tr>
<td>Monitoring Action</td>
<td>Monitoring Parameter</td>
<td>Monitoring Indicator</td>
<td>Intervention Period</td>
<td>Monitoring Frequency</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Verify the effectiveness of tree planting in the buffer strip</td>
<td>Implementation of compensation measures</td>
<td>Number of single trees planted</td>
<td>According to the estimated schedule</td>
<td>Once</td>
</tr>
<tr>
<td>Verify the effectiveness of stakeholder consultations throughout all the works phases</td>
<td>Stakeholder involvement</td>
<td>Number of meetings held Number of participants in meetings</td>
<td>During works phase</td>
<td>Continuous</td>
</tr>
<tr>
<td>Verify the restoration and cleaning of sites previously occupied by the contractor</td>
<td>Level of restoration and cleaning of sites</td>
<td>Measure’s effectiveness</td>
<td>On completion of the work</td>
<td>Once</td>
</tr>
<tr>
<td>Monitor the survival rate of trees in the buffer strips against plastic bag count</td>
<td>Rate of recovery and survival of seedlings</td>
<td>Percentage of recovery Survival rate</td>
<td>A year after implementation Two years after planting</td>
<td>Once</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

9. Public Consultations and Information Dissemination

Examination of the ESIA reports shows that the different stakeholders (including women and youths, associations and national and local administrative authorities) were consulted during the preparation of the studies. As part of the process, it was necessary to ensure the prior communication of relevant and sufficient information on the project to the stakeholders. The objectives of these consultations were to: (i) identify the main environmental and social challenges based on the project’s technical options; and (ii) allow the actors to express their concerns and expectations concerning the project.

During the preparation and appraisal missions, plenary sessions were also organized with the administrative services and the population of Djibo, Kongoussi, Tougan and Dedougou. In all, over 200 people participated in the meetings organized. A number of requests were made by the population during these plenary sessions. These concerned, in particular, illuminated parking areas along the main road, cattle tracks, reservoirs, an ambulance, rehabilitation of socio-economic infrastructure (schools, health centre, shops, women’s centre), sanitation and urban roads, access tracks to major markets and multifunctional platforms (MFP).

Given the funds available, not all of these requests can be met. They have been prioritized by the actors. During the appraisal mission, the actions retained were discussed and confirmed with the beneficiaries. All the actions retained are indicated in the section on complementary activities.

The process of consulting the population will have to continue during the project appraisal and implementation phases, in particular for: (i) site installation and works start-up; (ii) for the establishment of the baseline situation and monitoring/evaluation of project impacts; and (iii) monitoring of ESMP implementation.
10. Complementary Initiatives

These measures concern the implementation of related works and support to women’s activities. To accompany the asphalting of the main Kongoussi-Djibo (RN22) and Dedougou-Tougan (RN10) highways, the project includes plans to construct: (i) about 50 km of rural tracks linked to the RN22 and 60 km of tracks (RN 10) to open up the villages in the project area; (ii) 10 km of paving block roads using the labour intensive method, comprising 2 km in Kongoussi, 3 km in Djibo, 2 km in Dedougou, and 2 km in Tougan; and (iii) the traditional 90-km long cattle marketing track between Djibo and Kongoussi to improve road safety, protect goods and limit farmer/stockbreeder conflicts.

To support women in their daily efforts to reduce poverty and improve household living conditions, the project includes targeted actions for the dynamic women’s associations and groupings of Kongoussi, Bourzanga, Djibo and villages connected to the main highway. These actions are: (i) procurement of dairy product processing equipment; (ii) equipment for women in Tougan; (iii) the construction of 3 warrantage warehouses in Dedougou, Pasakongo and Massala; and (iv) the construction of multi-functional platforms for village women’s associations and groupings.

11. Climate Change

Main Challenges: the main challenges identified are the following: (i) a significant drop in rainfall with a southward shift of isohyets; (ii) the production of greenhouse gases (GHG).

Adaptation Measures: The adaptation measures retained are: (i) facilitation of access to groundwater resources along the road; and (ii) appropriate sizing of hydraulic structures factoring in rainfall and maximum flow return periods.

Mitigation Measures: Although there is no reference data on GHG emissions in the project area, a slight rise in emissions is expected mainly due to an increase in traffic. The main mitigation measures include: (i) more fluid traffic and regulation of speed, which can minimize CO2 emissions by 15% along the route; and (ii) the planting of trees, which will help to sequester part of the carbon emissions resulting from the road construction.

12. Conclusion

The probable negative impacts of the project during the works and operational phases are generally low to high. These impacts will be significantly mitigated by appropriate measures.
13. **Contacts**

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