SUMMARY OF STRATEGIC ENVIRONMENT AND SOCIAL ASSESSMENT (SESA)

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1. Project background

In Zambia, cashew trees are grown along the cashew hub, which is characterized by Kalahari sands that are relatively poor soils for most conventional crops. The cashew trees were first introduced by the Portuguese Traders in Barotse Land (Western Province) in 1940s. The growth of the cashew industry was very slow due to low production, lack of marketing and processing facilities. In 1985, the Zambia Cashew Company (ZCC) was established by Government of Zambia (GoZ) which managed to create commercial estates and cashew processing factory. Based on this, the cashew industry improved from 1986 to 1995 but drastically declined from 1996 due to sudden withdrawal of financial support to the ZCC and also premature inclusion of the ZCC on the privatization list. The GoZ has developed the National Cashew Development Strategy (NCDS: 2012-2016). The Strategy was prompted by GoZ and Citizens Economic Empowerment Commission (CEEC) which financed some preliminary cashew activities including (i) importation of cashew scions from Mozambique and (ii) establishment of cashew nurseries. The Cashew Growers Association of Zambia (CGAZ), member of the African Cashew Alliance, produced the Cashew Development Initiative (2014) in order to revive the cashew value chain. Due to the potential economic, social and environmental benefits of the cashew sub-sector, the GoZ included the CIDP on the priority list of the 2015-2017 pipeline projects. The GoZ requested financial support from the AfDB for the development of cashew tree crop project in Western Province. The Project is aimed at reviving the cashew industry by focusing on infrastructure development for the cashew value chain including cashew production, processing and marketing. The Project will aim at contributing to GoZ’s efforts of increasing crop diversification, productivity, processing and improving market linkages. CIDP will mainly contribute to core operational priority of infrastructure development and will ensure proper governance and accountability in its implementation.

The Zambia cashew hub, in Western Province, is estimated to cover an area of about 1.3 million hectares (ha) with the potential to produce approximately 130,000 tonnes of raw cashew nuts per annum. Details of the cashew hub are indicated in Table 1.

<table>
<thead>
<tr>
<th>Cashew Growing Blocks</th>
<th>Area (Ha)</th>
<th>Districts (Western Province)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td>440,000</td>
<td>Mongu, Limulunga and Senanga</td>
</tr>
<tr>
<td>Block 2</td>
<td>457,000</td>
<td>Kalabo, Nalolo and Sikongo</td>
</tr>
<tr>
<td>Block 3</td>
<td>282,000</td>
<td>Shangombo and Sioma</td>
</tr>
<tr>
<td>Block 4</td>
<td>136,000</td>
<td>Lukulu and Mitete</td>
</tr>
<tr>
<td><strong>Total Area (ha)</strong></td>
<td><strong>1,315,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

The Project is classified as environmental and social category II according to the Bank’s ESAP, as it aims to improve the small-scale infrastructure for development of cashew trees/plantations. The planned project activities, by their size, will not create new environmental and social issues. Above that, the development of cashew trees/plantations is an important contribution of adaptive activity to the climate change. In accordance with the provisions of the Bank and GoZ Environmental regulations, it is a requirement to prepare a
Strategic Environment and Social Assessment (SESA) in order to ensure that the Project will not cause negative impact to the biophysical environment and the social environment.

2. Project Design

Objectives

The development objective aims to contribute to economic growth and food security. The overall Project objective is to contribute to country’s poverty reduction and improved household incomes through improved cashew production, processing and marketing. Enhanced incomes will lead to improved household food security. In this regards, the Project will: (i) increase cashew tree productivity; (ii) contribute to improved household income and food security, (iii) increase foreign exchange earnings from cashew products; and (iii) improve rural employment for men, women and youths.

Project Components

The proposed CIDP has 3 components: (1) Infrastructure for Cashew Value Chain Development with 3 sub-components, (i) irrigation systems for cashew nursery and gardens, (ii) infrastructure for agro-processing and marketing, and (iii) cashew plantation rejuvenation and establishment; (2) Capacity Building with 2 sub-components, (i) training and technical support, and (ii) matching grant; and (3) Project Management with 2 sub-components, (i) project coordination, and (ii) monitoring and evaluation. Gender issues have been considered in all planned Project activities and about 50% of the beneficiaries will be women. Environmental and social issues have also been considered. The Project activities will be implemented in 10 out of Districts of the Western Province namely, Mongu, Limulunga, Senanga, Kalabo, Nalolo, Sikongo, Shangombo, Sioma, Lukulu, and Mitete. According to 2010 census, the Western Province had total population of 902,974 out of which 469,469 (52%) are female. There are a total of 180,179 households of which 147,047 (82%) are agriculturally based.

Project Costs

The Project cost, including physical and price contingencies, is USD 63.68 million which will be financed by (i) ADB Loan of USD 45.00 million (70.7%) covering all major Project activities, (ii) the GoZ contribution of USD 18.45 million (29.0%) through cash contribution of ZMW 10 million per year, monetary value for existing GoZ staff salaries, office space and utilities, and (iii) beneficiaries in-kind contribution of USD 0.23 million (0.3%) through specific labour for cashew tree planting.

Project Benefits

The Project will benefit 70,000 smallholder farmers including 35,000 (50%) women and 7,000 youths (10%), each planting 1 ha (100 cashew trees). The Project will create the equivalent of about 25,000 full time jobs (>50% women) along cashew value chain thus production, processing and marketing. In addition, 3,000 rural youths will access full-time jobs through marketing and processing activities. At full maturity of the cashew trees, each farming household with 1 ha will have annual net income of ZMW 2,422 (USD 346). The FIRR is estimated at 15.7% and FNPV of ZMW 776 million (USD 110 million). The EIRR is 34% and ENPV of ZMW 1.1 billion (USD 157 million). Other positive effects will include
enhanced economic value of marginal lands (Kalahari sands), contribution to environmental conservation through cashew plantation, and rehabilitation of feeder roads within the Kalahari sands which will improve vehicle tyre traction, agro-trade and access to amenities like schools and hospitals.

3. **Identification of environment and social impacts of the project and mitigation measures**

3.1 Environment impacts and mitigation measures

**Nurseries, cashew rejuvenation and plantation activities**

The project proposes to produce in six years, 6 million cashew plants to cover 53,000 ha of new plantations and 17,000 ha of cashew rejuvenation. These new cashew plants will be produced in 8 nurseries.

**Positive impact**

- The positive impact on the environment is the enhancement of the vegetation cover in the areas.
- The plantation of new cashew in the area offers an important vegetation cover which is an adaptive and mitigation measure for climate change. It will contribute to carbon sequestration and reduction of greenhouse gas in the atmosphere.
- The cashew canopy will protect the soil against solar and conserve soil moisture.
- The presence of cashew trees/plantations will offer a good ecosystem for biodiversity in particular bird and insects like bees etc.

**Negative impact**

**Loss of vegetation**

The preparation of nurseries for the plantation of new cashew plants normally requires clearing important space and destruction of natural vegetation. However, for nurseries in most cases will be established on unproductive Kalahari sands and in some cases the clearing of vegetation or existing old cashew trees, may preserve big trees because nurseries can be developed under trees and the canopy can help as shade. The impact will be important specifically for clearing of plantation area because even existing old cashew trees will be cut.

**Mitigation measure**

During nurseries preparation, existing old cashew trees must be preserved. For the plantation of the new cashew plants it is recommended to prepare nurseries for trees plantation with the local species with the supervision of the District Forestry Officer. The project can support the production of 50,000 plants of trees that can be planted by the community as compensation of existing old cashew trees which will be cut down. The production of the new plants is estimated to 50,000 USD (production and transport to the fields).

To reduce the effect of vegetation cover during rejuvenation of existing cashew trees, that activity can be started after 2 or 3 years after the development of new cashew plants. It is also recommended to encourage intercropping in the first 3 years for new plantation to protect the soil and increase others crop production and the soil protection.
**Land and soil erosion**

The vegetation clearance on the slopes will increase risks of erosion and land degradation.

**Mitigation measure**

For the risk of erosion, it is recommended to avoid as much as possible the sloppy areas for establishment of nurseries and cashew plantation. However, in cases where slopes cannot be avoided, the slopes shall be covered by mulch walls and planted with grass upon completion of the civil works. In addition, cashew trees to be transplanted on mind slopes, upon reaching maturity, will assist to stabilise the soil and provide ground cover.

**Pollution by pesticides**

It is recognized that without controlling powdery mildew disease there will be significant crop loss (more than 70%) and the remaining production will be of poor quality (Sijaona and Shomari 1987, Waller et al., 1992 in Tanzania), a disease equally common in Zambia. There are also a number of other pests, such as Helopeltis bugs, coconut bugs and mealy bugs which attack young succulent shoots which impede the flowering process and hence low cashew production, unless controlled.

It is therefore necessary to undertake pest and disease control measures to cashew plantations. Poor application of pesticides (whether over-doses or under-doses) causes severe effects. For example, applying lower rates than the recommended make the pathogen to build resistance against the fungicide (Sijaona and Mansfield, 2001). On the other hand, excessive use of inorganic pesticides can lead to high levels of the chemical above authorized limits in the kernels, leading to unnecessary environmental pollution and additional cost to the smallholder farmer. These conditions are similar in the Western Province.

The development of cashew plants in nurseries will use significant quantities of agrochemicals (pesticides) which will increase risks of pollution of surface water course, groundwater and soil. The use of agrochemicals can also affect others organism non-target which are useful for environment (insects and birds) and contamination of workers during spray operation.

**Mitigation measures**

For the use of pesticides, all the pesticides to be procured must be approved by ZEMA in respect of Zambia regulation’s on pesticides. The SESA recommends establishing Nurseries some distance away from habitation, watercourses, and boreholes to avoid risks of water contamination. For the pesticide resistance risks, it is recommended to vary the range of pesticide to be used.

Pesticides must be transported with precaution and in closed container. The pesticides must be stored in secured warehouse, on palettes and separate from others items. After application, the containers must be returned to the manufacturer to be disposed appropriately. The SESA recommends the project to contract an IPM specialist to prepare a training manual and conduct a training of trainers composed by Provincial and Districts Agricultures Officers and key partners who will train farmers on pesticides use. The storage and handling of pesticides
is one activity that can contaminate the environment, especially ground and surface water. However, if stored safely in a secure location, agricultural pesticides pose little danger to the environment. CIDP will use the Best Management Practices (BMPs) for handling and storage on the farming unit. The farmers will be trained on the BMP. The cost of that activity including the training will be provided in capacity building as part of training in agricultural good practices.

Wastes and water pollution

Solid and liquid wastes from construction camps and use of pesticides will be a source of pollution of groundwater used for nursery irrigation and consumption. The risk of groundwater contamination is usually low to moderate because most pollutants are usually retained by infiltration practices and sandy soil. In nurseries, some non-biodegradable seedling plastic bags are used which can contaminate the environment when they are disposed without any precaution. Non-control of pesticides in nurseries can lead to the groundwater pollution.

Mitigation measures

- Sewage will be handled at septic tank and soak-away systems. In the project area, the latrines will be located at least 100 m distance from the borehole to minimize the risks of contamination. The water will be regularly analysed to monitor the contamination risks.
- For the plastic bags to be used in nurseries it is recommended to procure biodegradable seedling plastic bags which are environmentally friendly. In case of using non-biodegradable plastic bags, it is recommended that after transplanting, all the plastic bags should be removed for proper disposal (Hazardous Waste Management Regulations Statutory Instrument No. 125 of 2011 in respect of minimum specification of health care waste incinerator of Zambia Environment Council). Adopt IPM and establish nursery far away from watercourse, and boreholes to avoid risks of water contamination.

Civil works

The civil works include feeder roads rehabilitation, installation of irrigation systems for nurseries, rehabilitation of ZARI structures, construction of warehouses and storage sheds, drilling of boreholes, and construction of cashew processing facilities.

Impacts during Construction

Many of the Project’s environmental impacts will occur during construction phase of the cashew infrastructure due to the intensity of activities. However, the impacts will mainly be short-term. The potential negative impacts expected during construction shall include: generation of waste from construction and rehabilitation works; generation of dust from civil works and stockpiling of soil; noise; soil erosion; sedimentation due to earth works and construction of access roads, visual intrusion; and occupational safety and health risks. The impacts during construction will be typical of any building construction works.
Negative Impacts

Land and soil erosion

Construction activities shall involve clearing vegetation and excavation of earth, stock piling of construction materials such as sand, gravel, and coarse aggregates. This makes the soil prone to various forms of erosion such as wind and surface run-off. Loss of top soil will occur in areas where construction materials will be mined and where temporary access (to collect construction materials) may be required. However, it should be noted that the top soil is agriculturally not productive since it is dominated by the Kalahari sands.

Mitigation measures

It is recommended that provision be made for strict measures to control erosion and runoff. The Contractor should ensure that all excavated soils are properly stockpiled and where necessary, sprayed with water. At the end of construction works; borrow pits for local construction materials will be rehabilitated by filling and re-vegetating. For rural road rehabilitation, local material should be exploited in authorised quarries.

Loss of vegetation

There will be loss of vegetation during land clearing and construction of different cashew warehouses, storage, and processing facilities/factories. The impact will be of low significance as the site necessary is small scale and will be in the Government or private land and no habitats of key biodiversity will be affected.

Mitigation measures

This will be important for rural road rehabilitation. It is recommended to ensure that vegetation and trees are only cut where it is absolutely necessary. The natural vegetation and pockets of indigenous trees and plants within the area should be protected to the extent possible. Also it is proposed to plant indigenous trees for compensation of cut trees. The borrow pit for local material will be rehabilitated. A provision for tree nurseries and plantation with the support of Provincial and Districts Forestry Officers is as proposed in the previous paragraph.

Generation of Waste

Construction and rehabilitation activities will generate solid wastes from materials such as unused concrete, broken bricks, metal sheets, plank off-cuts, and other solids from the construction site. Solid wastes from construction activities and packaging materials may contaminate the soil and deface the landscape. Careless disposal of solid waste may affect the existing scenery, and restrict peoples’ movement, and in the case of sanitary and hazardous wastes (e.g. oils, paint, and asbestos) may also present a health risk. However, due to the limited nature of the construction and rehabilitation activities, the impacts will be localised, minor and short term.
Mitigation measures

All construction waste will be disposed of at a ( Provincial or District) designated waste disposal site. Solid waste generated by construction workers should be disposed of in bins to be provided on site and taken off-site for disposal to designated waste disposal site. Temporary pit latrines should be constructed for the construction workers in accordance with the national occupational health and safety standards.

Water Pollution

As a result of the loosening of soils due to movement of vehicles and extraction of construction materials, sediments will be generated and will subsequently be washed away into drains and nearby streams, causing water pollution and siltation. Water pollution from construction wastes as well as on-site makeshift toilets could also occur. The impacts will be localised, moderate and short term. The construction activities may lead to changes in natural drainage flow pattern of surface water and runoff, particularly if new buildings are to be constructed near existing drainage lines. Changes in natural drainage flow pattern are likely to occur due to construction of temporary drainage channels for protecting extraction areas for local materials, construction sites and temporary access roads. Clearing of vegetation in some areas may lead to increased runoff. Construction waste and rubble, if not disposed in designated waste disposal sites, are likely to lead to clogging of drainage systems and, in some places, creating stagnant pools of water where mosquitoes, flies and other insects might breed. The nature of these impacts will be localised, short term and moderate because most of constructions are small community warehouses, rehabilitation of existing facilities and rehabilitation of existing rural roads.

Mitigation measures

To mitigate against these effects, suitable facilities for the proper storage of materials, fuel and lubricants should be provided and maintained. This would include the provision of a sealed ground and appropriate drainage systems including oil and grease traps in connection with all the above facilities as well as for vehicle and plant washing sites. Petrochemicals should be stored in a secure area with concrete floor to avoid seepage into groundwater.

Dust

Dust will be generated from bulk earth works and excavation works and may negatively affect surrounding environment. These activities will result in generation of fugitive dust. The dust may settle on buildings, vegetation and affect its growth and appearance and pose human health risks to surrounding people. The area will therefore experience localized air pollution as a result of the project construction works.

Mitigation measures

During land clearing and civil works in particularly rural road rehabilitation, dust will be suppressed by periodic spraying of water to keep the site and civil works damp.
Environment Impacts during exploitation phase

Infrastructures constructed will be utilised by the beneficiaries to transport, store and processing the cashew produced.

Negative impacts

Solid wastes

Solid wastes during the processing of cashew. During the visit of the cashew nut processing factory in Mongu, it was noted that cashew wastes were stored in open area and no specific area for disposal.

Mitigation measures

Develop and promote a composting programme.

Air pollution

Air pollution by smoke from the cashew nut processing factories. The impact will be low because the numbers of factories in the region will be few.

Mitigation measures

The construction of the cashew nut factories will be in accordance with the standard and an appropriate chimney will be installed.

Land and soil erosion

The run-off in drains of rural road could be source of important erosion if road maintenance is not regularly made by the beneficiaries and local administration

Mitigation measures

A plan for rural road maintenance should be prepared and executed the beneficiaries with the supervision of the district technical services

3.2 Social impacts and mitigation measures

The social impacts cover all activities of the project

Positive impacts

- Both direct and indirect employment will result from the cashew infrastructure development project skilled and unskilled labour. The construction of buildings to be
used as warehouse, processing and factories and road rehabilitation will mostly use a lot of unskilled labour due to the nature of activities. In processing and factories mostly women will have opportunity for employment. During the visit to the cashew nut processing factory, in Mongu District, it was noted that women are appreciated for that kind of job.

- Due to the presence of the project many unemployed people in Western Province will have opportunity of employment in cashew farming and processing and receive regular income to boost their economic situation.
- During the operation phases, it will mainly involve permanent workers from the local community and beyond depending on their specialties
- Creation of market for goods and services - The Western Province will benefit from business opportunities, which are likely to increase. During construction, there will be a demand for various goods and services some of which will be supplied by residents.
- During commercialization of cashew, Government will have revenue from the taxes
- Community and cooperatives will have appropriate facilities for storage, processing and cashew transformation that will help them to produce high quality cashew nuts
- The rural road rehabilitation will help for commercialization agriculture products between the Districts and will facilitate access to the schools, health and other facilities.

**Negative impacts**

Risk of contamination by pesticides

**Mitigation measures**

Farmers will be trained on how to handle pesticides during the transport, storage and application. Workers in charge of pesticides application must be equipped with appropriate Personnel Protective Equipment (PPE) (Gumboots, gloves and noise masks).

**Community health and safety**

The presence of a considerable number of workers may lead to potential effect on community health in particularly;

- Increased transmission of communicable diseases due to the presence of non-local workers.
- Increased transmission of STIs including HIV/AIDS associated to the increase of income from the project activity.

**Mitigation measures**

The PCU, through the Provincial and District Health Services, will organize periodic sensitization on the STIs and HIV/AIDS for the farmers and for civil works labourers.

**Noise**

It is expected that noise will be generated during the construction period. Noise will be generated by civil works equipment such as concrete mixers, graders, compactors, excavators, vehicles and other construction processes, which may affect surrounding people, wildlife and others social activities (Schools, Health Centers, Administration activities, etc.)
Mitigation measures

To minimize disturbance, the use of noisy heavy and plant equipment will be limited. Working hours will be respected and activity for road rehabilitation must be accelerated to reduce duration of disturbance.

Occupational safety and health risks

A construction site poses an occupational risk to workers as they undertake various construction activities and handle construction equipment. Workers are exposed to various hazards such as heavy machinery, dust, chemicals and others. Accidents may also occur at a construction site and may endanger the workers. This is also a potential risk for cashew nut processing facilities/factories.

Mitigation measures

Contractors must provide workers with appropriate PPE to minimize exposure to occupational safety and health hazards. Workers should be educated on safe use and handling of equipment to be used during construction. The use of PPE should be monitored in order to ensure that it is correctly used by workers.

Risk of road accident

During rehabilitation of rural feeder roads, there will be risk of accidents due to the speed of the vehicles specifically near the social facilities (schools, health centre, villages, etc.)

Mitigation measures

Contractor must put the speed limitation sign-posts and construct humps for reducing speed near the villages, schools and others social facilities.

3.3 Cumulative impacts of the project

Cumulative impacts are those resulting cross effects, additive or synergistic to the implementation of the project with other activities of the same nature or of different nature in the project area. Currently in Western Province the Pilot Program for Climate Resilience (PPCR) with the financial support of World Bank is under implementation with objective of strengthening climate resilience through activities for improving agriculture and livestock practices, diversifying livelihoods into sustainable activities that are climate resilient, and/or moving activities to less climate sensitive locations.

Combined activities of CIDP and PPCR will induce in the region positive cumulative impact by increase climate resilience in the target communities and every effort will be made to avoid any significant negative environmental impacts through increase of vegetation cover by cashew canopy and soil protection. For social impact, most of cumulative impacts will also be positive because, both projects will increase income generation through the employment
opportunities of the local population in particular women and youth where currently they are very few possibilities of employment.

The mitigation measures presented in the paragraphs above (3.1 and 3.2) will be applied to mitigate negative impacts that will appear during the project implementation.

3.4 Project vulnerability to climate change

The project will be implemented in a zone considered as arid of Zambia and with high sensitivity to climate change. Drought and flooding conditions that affect regularly the Western Province of Zambia may affect the success of the CIDP and the following risks are predictable:

- In case of severe drought, there is a risk of drying up of water sources and lack of irrigation water for nurseries (cashew trees seedlings).
- Risks of destruction of young plantations and plants in nurseries due to the hot and dry spells.
- Increased dryness can also compromise the success of rejuvenation of cashew trees
- Heavy rainstorms can assist to the destroy cashew plants and increase soil erosion.
- Floods can damage the hygiene and creating supportive environments for the proliferation of disease vector.
- The floods will also pollute the groundwater including boreholes.

Mitigation measures

- To mitigate the effect of drought for the nurseries and transplanted young cashew plants, some boreholes will be constructed for irrigation.
- For flood, the farmers will be trained to prepare some drain to reduce water particularly for nurseries and very young cashew plants (transplanted).

4. Environment and Social Management Plan (ESMP)

The proposed ESMP is an action plan prepared in consultation with government Technical Officers and Project partners. It shows how the environmental and social impacts of the project will be managed to minimize, avoid or eliminate negative impacts while enhancing the positive impacts. It is also a management tool that can be used to monitor the implementation of the prescribed measures means os implementation and responsibilities in a given period of time and also cost estimates for implementing the measures. Table 1 and 2 below summarizes the ESMP activities and the services/units responsible for their implementation.
### Table 1: Environmental Management Plan (EMP)

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>POTENTIAL SIGNIFICANCE</th>
<th>MITIGATION MEASURE</th>
<th>TIME TARGET</th>
<th>RESPONSIBILITY FOR MITIGATION</th>
<th>RESPONSIBILITY FOR MONITORING</th>
<th>ESTIMATED COST (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cashew Nurseries, cashew planting and cashew re-juvenation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetation clearance</td>
<td>Erosion</td>
<td>Low</td>
<td>Limit clearance to the area necessary for the activity. Proceed to tree plantation for compensation of trees cut</td>
<td>During life project</td>
<td>Contractor</td>
<td>PCU District Forestry Officer</td>
<td>50 000</td>
</tr>
</tbody>
</table>
| Pesticides use | Contamination Soil, water and environment in general | Medium | -installing nursery far away from habitation, water course, and boreholes to avoid risks of contamination  
- Avoid spray during rain and windy weather  
- Adopt IPM approach  
- Procure pesticides approved by ZEMA | At the beginning of the project | PCU/Consultant | PCU PACO ZEMA | In training |
| Contamination of workers and farmers | High | | Training of workers on handling pesticides, transport, storage and waste disposal  
- Port of personnel protective equipment | During project implementation | PCU Consultant | PCU PACO | |
| Use of non biodegradable plastic bags | Environment pollution | High | - Procure biodegradable seedling plastic bags  
- If not after transplanting, recover all the plastics for a proper disposal | During project implementation | Contractor | PCU ZEMA | Include in project cost |
<p>| <strong>Civil works (Rehabilitation of ZARI Centre, construction of warehouses, processing and cashew factories and rehabilitation of feeder roads)</strong> | | | | | | | |
| Vegetation clearance | • Soil Erosion and land degradation | • Low | • Limit clearance to minimum area necessary. Proceed to tree plantation for compensation of trees cut | During construction phase | Contractor | PCU District Forestry Officer | Include in the 50 000 USD presented above |
| Earthworks | • Dust | • Medium | • Suppress dust by regularly sprinkling with water | During construction phase | Contractor | PCU | Included in works budget |</p>
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>POTENTIAL SIGNIFICANCE</th>
<th>MITIGATION MEASURE</th>
<th>TIME TARGET</th>
<th>RESPONSIBILITY FOR MITIGATION</th>
<th>RESPONSIBILITY FOR MONITORING</th>
<th>ESTIMATED COST (USD)</th>
</tr>
</thead>
</table>
| Erosion of exposed surfaces | Medium | • Clear minimum necessary area.  
• Compact exposed soil  
• Undertake construction during dry season  
• Install sediment traps on natural drainage paths at construction site | During construction | Contractor | PCU | Included in works budget |
| Waste disposal | Contamination of local site and soil from engine oils, fuels, etc | Low | • Store and contain rehabilitation and construction materials on lined surfaces, in covered areas.  
• Locate storage areas for fuels and lubricants away from natural drainage paths  
• Bund and line floor of storage areas with concrete  
• Use well maintained equipment that is not leaking will have to be ensured | During construction | Contractor | PCU | Included in the works budget |
| Waste disposal | Contamination of local site and soil from hazardous wastes | Medium | • Collect, separate and dispose of all waste to designated disposal sites as required Zambia legislation. Ensure adequate on-site or nearby catering and sanitary facilities are available for the construction workforce. | During construction | Contractor | PCU | Included in the works budget |
| Waste disposal | Contamination of local site and soil from hazardous waste | High (if hazardous materials is already present on site) | • Limit use of all hazardous waste to a minimum. Ensure all hazardous waste is sent to a managed disposal site. Asbestos should not be used, but if there are potential issues with old asbestos at a construction site:  
(i) seal the waste asbestos in plastic containers and dispose in appropriate landfills or designated sites,  
(ii) avoid exposing personnel to dust by providing them with appropriate equipment during disposal, and  
(iii) Provide training to workers in how to recognize and handle asbestos. | During construction | Contractor | PCU | Included in works budget |
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>POTENTIAL ENVIRONMENTAL IMPACT</th>
<th>POTENTIAL SIGNIFICANCE</th>
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<th>RESPONSIBILITY FOR MONITORING</th>
<th>ESTIMATED COST (USD)</th>
</tr>
</thead>
</table>
| Sourcing materials | ● Creation of borrow pits from quarrying of construction materials  
● Loss of indigenous forests | ● Low  
● Medium | ● Borrow material and aggregate should be sourced from existing and registered quarries  
● Ensure that any timber is derived from sustainably-managed sources. | During construction | Contractor | PCU | Included in the works budget |
| Use of vehicles and operation of heavy machinery | ● Risk of safety  
● Pollution from oils, fuels, etc  
● Disturbance due to noise from equipment and machinery | ● High  
● Low  
● Medium | ● Determine and enforce appropriate speed limits for public and work areas, provide clear warning signage, and use workers to divert or hold traffic during manoeuvres on public roads. Maintain all vehicles and machines in good condition.  
● No on-site maintenance of vehicles or machinery.  
● Limit use of noisy heavy equipment  
● Restrict noisy activities to minimize disturbance (likely outside of office hours). Schedule large deliveries when traffic is minimal. | During construction | Contractor | PCU | N/A |
| Safety and health | ● Risk of safety of workers and the public  
● Risk of safety of workers and the public | ● Medium | ● Provide appropriate Personal Protection Equipment for all tasks. Ensure first aid kits and trained officers are available on site.  
● Install adequate fire extinguishers. Establish and train in emergency evacuation procedures.  
● Establish appropriate speed limits and signage on driveways and parking areas.  
● Fence work site | During construction and soon after employment | Contractor | PCU  
ZEMA | Included in civil works budget |
<p>| Total | | | | | | | 50 000 |</p>
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>POTENTIAL IMPACT</th>
<th>SOCIAL SIGNIFICANCE</th>
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<th>ESTIMATED COST (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pesticides use</td>
<td>Contamination of people and the living area</td>
<td>Medium High</td>
<td>Training of farmers and all users in pesticides handling, transport, storage and waste disposal - Port of personnel protective equipment when applying pesticides</td>
<td>During project implementation</td>
<td>PCU/ Consultant</td>
<td>PCU PAC ZEMA</td>
<td>In training</td>
</tr>
<tr>
<td>Community health and safety</td>
<td>Increase transmission of diseases included STIs, VIH/AIDS</td>
<td>Low</td>
<td>The PCU with the support of provincial and District health services will organize periodic sensitization on the STIs and VIH/AIDS for the farmers and for civil works man powers,</td>
<td>During project implementation</td>
<td>DAC CONTRACTOR</td>
<td>PCU</td>
<td>10 000 USD</td>
</tr>
<tr>
<td>Noise</td>
<td>Disturbance by noise</td>
<td>Low</td>
<td>Work only day time and accelerate works to reduce duration of disturbance.</td>
<td>During construction phase</td>
<td>Contractor</td>
<td>PCU</td>
<td>N/A</td>
</tr>
<tr>
<td>Occupational safety and health risks</td>
<td>Dust • Fire accident • Various hazards</td>
<td>Medium</td>
<td>• Provide appropriate Personal Protection Equipment for all tasks. Ensure first aid kits and trained officers are available on site. • Install adequate fire extinguishers. Establish and train in emergency evacuation procedures. • Establish appropriate speed limits and signage on driveways and parking areas. • Fence work site</td>
<td>During the project implementation and during exploitation</td>
<td>Contractor Beneficiaries</td>
<td>PCU</td>
<td>N/A</td>
</tr>
<tr>
<td>Rural Road</td>
<td>Risk of road accident</td>
<td>medium</td>
<td>Install speed limitation signalizations where is necessary and construct humps for reducing speed at the level of villages, schools and others social facilities,</td>
<td>During rural road rehabilitation</td>
<td>Contractor</td>
<td>PCU</td>
<td>Included in the works budget</td>
</tr>
</tbody>
</table>

**Project vulnerability to climate change**

<table>
<thead>
<tr>
<th>Drought</th>
<th>Risk of drought to cashew plant</th>
<th>High</th>
<th>Construction of boreholes and irrigation</th>
<th>Beginning of the project</th>
<th>Contractors PCU Beneficiaries</th>
<th>Included in project Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding</td>
<td>Risk of destruction of nursery and young cashew plan</td>
<td>Medium</td>
<td>Install protection drain</td>
<td>During implementation project</td>
<td>Beneficiaries PCU Beneficiaries</td>
<td>N/A</td>
</tr>
</tbody>
</table>

| Total | | | | | | | 10 000 |
5. **Institution arrangement for project implantation**

The MAL will be the Executing Agency (EA) for the Project which will be implemented through the Director of Agriculture, over a period of 6 years given the long gestation period of cashew tree crops. The Project will be implemented in, namely Mongu, Limulunga, Senanga, Kalabo, Nalolo, Sikongo, Shangombo, Sioma, Lukulu, and Mitete Districts in Western Province with high poverty level (80.4%). Due to MAL technical staff capacity constraints, a Project Coordination Unit (PCU) will be set up, in Mongu District, for day to day effective implementation of the Project activities which will consist of competitively recruited Project Coordinator, Accountant, M&E Specialist, Procurement Specialist, Environmental Specialist and Gender Specialist who will be National Experts. The Project will also recruit competitively, 5 Cashew/Tree Crop Development Officers to cover the 10 participating Districts. The Project will be monitored by multi-disciplinary Cashew Task Force and Project Steering Committee set up by the GoZ for technical and policy guidance respectively.

6. **Environment and social monitoring**

The monitoring will be undertaken to ensure that the proposed mitigation measures for negative impacts are implemented. For this reason, it is important that the environmental and social monitoring to be included in the project planning. The essential objectives are: (i) to measure the level of completion (success or failure) of implementation of mitigation measures; (ii) Identifying unpredicted impacts; and (iii) facilitate integration of environmental and social management in the project implementation interventions. Monitoring will be carried out mainly during the cashew nurseries preparation at community and District, plantation and rejuvenation action, boreholes construction, application of agro-chemicals, construction of warehouses, processing and Cashew factories facilities and rehabilitation of rural access roads. To assess water pollution around the nurseries due to pesticides, samples will be taken before the use of pesticides year 1 for reference and year three after two years to evaluate the level of pollution and from the analyses result. The water analyse will be conduct by a specialized laboratory of ZARI or Zambia University in Lusaka. For that activity a provision of **20 000 USD (Borehole water sampling in 8 nurseries analysis)** is proposed. As part of the cashew project, the local environmental expert in collaboration with ZEMA will be responsible for regularly checking whether mitigation measures were implemented by his representative based in Ndola town. At year 4 a mid-term independent evaluation of ESMP implementation will be necessary. The cost of the mid-term evaluation is estimate to **15 000 USD**. The following table provides a schedule and estimated costs for environmental and social monitoring.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Mitigation measures proposed</th>
<th>Indicators</th>
<th>Service responsible</th>
<th>Time</th>
<th>Cost in USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery, plantation and rejuvenation</td>
<td>Nurseries Installed 100 m away from watercourse</td>
<td>Distance from water course</td>
<td>PCU ZEMA</td>
<td>Project Start</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Use biodegradable seedling plastic bags</td>
<td>Quality of plastic bags</td>
<td>PCU ZEMA PROVINCIAL FORESTRY OFFICER</td>
<td>Procurement period</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Avoid installation of nursery on sloppy terrain</td>
<td>Type of terrain</td>
<td>PCU PACO DACO</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Boreholes water analysed</td>
<td>Report of water analysis</td>
<td>ZARI</td>
<td>Year 1 and Year 3</td>
<td>20 000</td>
</tr>
<tr>
<td>Usage of pesticides</td>
<td>Training of 100 trainers on BMP for spray, storage, transport and disposal</td>
<td>Training report Storage facility</td>
<td>PCU Consultants</td>
<td>1st Year</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Siting the storage facility</td>
<td></td>
<td></td>
<td>During the project implementation</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Training of farmers</td>
<td>Training report PPE stock</td>
<td>PCU PACO DACO</td>
<td>1st Year</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Port of PPE</td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Civils works</td>
<td>Phyto-pathological monitoring by ZARI</td>
<td>Periodic report</td>
<td>ZARI PCU</td>
<td>Continuous</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Use quarries authorized</td>
<td>Location of quarries</td>
<td>PCU ZEMA</td>
<td>During works</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Dispose earth wastes in appropriate area</td>
<td>Location of disposal area</td>
<td>PCU ZEMA</td>
<td>End of works</td>
<td>N/A</td>
</tr>
<tr>
<td>Feeder roads</td>
<td>Equip workers with PPE</td>
<td>PPE Stocks</td>
<td>Contractor</td>
<td>During works</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Equip all houses and factories with fire extinguisher and train the users</td>
<td>Number of fire extinguishers and training report</td>
<td>Beneficiaries PCU</td>
<td>End of construction</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Use the quarries authorized</td>
<td>Location of the quarries</td>
<td>Contractors</td>
<td>During construction</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Plantation of trees for compensation</td>
<td>Number of ha of trees planted</td>
<td>Contractors Communities</td>
<td>End of road works</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Activity | Mitigation measures proposed | Indicators | Service responsible | Time | Cost in USD
---|---|---|---|---|---
ZEMA | Installation of humps and sign for speed limits | Number of humps in place | Contractors PCU | Thrice/yr | 18000
Support ZEMA supervision | Supervision report | PCU | Year 4 | 15 000
Mid-term review | Environmental Audit (midterm review) | Report | PCU Consultant | | 15 000
Total Cost | | | | | 53 000

*N.B N/A that means the cost is included to the contract cost or ESMP implementation cost*

### 7. Capacity Building

As part of the implementation of mitigation of environmental and social negative impacts, a change in behaviour of all stakeholders is needed in terms of attitudes, knowledge and practices. The proposed approach for managing environmental and social risks, project managers, beneficiaries and partner services must be trained to fully play their roles in the planning and implementation of the project including ESMP. The project will provide for training trainers on ESMP and training of farmers in particularly Pest Management Practices and good agricultural practices. An environment and social consultant will be recruited at the beginning of the project for training and capacity building on the ESMP. This will be for all project staff, Provincial staff, and Districts staff, representatives of smallholder farmers, cashew nut processing factory staff and NGOs/CSOs involved in the project.

The expected outcome of this training will be to raise awareness about environmental, social, health and safety safeguards so as to minimize risk and enhance benefits from implementation of CIDP project activities. The expected output of the training will be to ensure that trainees understand and implement the proposed ESMP throughout the project period. The ESMP training will revolve around environmental and social mitigation guidelines, general environmental and social awareness, and legislative aspects of environmental and social safeguards compliance during the construction as well as operation of activities, in order to minimize the adverse environmental and social impacts of the project. This will also cover health and safety management during construction and project implementation. In addition, workers will be trained on the effective use of protective clothing (PPE), emergency kits (Fire Extinguishers) and First Aid measures. After the training, a report will be prepared. The cost of ESMP training is **30 000 USD (10 000 will be consultant fees for 20 days, 20 000 for training materials and others logistics).**

### 8. Public consultation

During the project preparatory phase, in terms of environmental issues, several meetings were carried out with stakeholders from the Western Province, District of Mongu, Senanga and Limulunga. These meetings involved the High technical officers of the MAL’s, Provincial Technical staff (Forestry, Agriculture, HIV/AIDS coordination), Cashew industry and smallholder farmers’ representatives, Research and Academic institutions, and specialised NGOs/CSOs. Two stakeholders’ consultation workshops were held during preparation mission to discuss the project concept and design included environment aspects.

In relation to ESMP, the PCU team will organize an information meeting to all stakeholders
and discuss on the possibility of implementation of mitigation measures. The stakeholders will include the farmer’s beneficiaries, the cashew nut processing factories’ managers and District and Provincial Technical Staff, and relevant partners. These consultations will aim to:

(i) Keep local communities updated on progress of project activities;
(ii) Seek feedback on project activities;
(iii) Ensure compliance of ESMP during the project implementation and during civil works;
(iv) Disseminate the ESMP to relevant stakeholders.

During the implementation phase of the project, farmers and community consultations will occur regularly and continuously throughout the project period. This initiative will ensure that any grievances by the local communities are addressed in good time hence guarantee that the project will be supported by the community and all beneficiaries. In addition, civil works construction workers will be consulted to ascertain their compliance with the proposed ESMP safeguard procedures. Complaints with regard to CIDP will officially be conveyed to PCU via phone (verbal) or letter. However, verbal communications should be officially followed up by written communication (eg letter). The PCU will assess the complaint(s) and respond to the complainant(s) within two weeks. Complaint reports will be done monthly by PCU and put in the Project records. In-case the complainant is not satisfied with the results he/she will be required to appeal to the Provincial Agriculture Coordinator (PACO), through PCU, who will respond within two weeks. The SESA will be shared with the Zambian Environmental Management Authority (ZEMA). The purpose will be to inform them about the project activities, negative environmental and social impacts expected from CIDP and proposed mitigation measures.

9. Implementation of SESA cost

Table 4: Summary of the SESA implementation cost

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>Cost in USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ESMP</td>
<td>60,000</td>
</tr>
<tr>
<td>2</td>
<td>Capacity building (Training in ESMP by consultant)</td>
<td>30,000</td>
</tr>
<tr>
<td>3</td>
<td>Environment and social monitoring</td>
<td>53,000</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>143,000</strong></td>
</tr>
</tbody>
</table>

10. Conclusion and recommendations

The proposed CIDP has the potential to significantly improve smallholder farmers and household incomes in the target districts of Mongu, Limulunga, Kalabo, Lukulu, Senanga, Nalolo, Sikongo, Shangombo, Sioma and Mitete. An improvement in the income of the smallholder farmers will translate to improved condition of life and cash to secure food security and other socio-economic needs. Besides, project development and operation will provide considerable economic opportunity for material/equipment suppliers, construction contractors and agriculture professionals. ESMP presented in the SESA will be used to mitigate the impacts during cashew production, processing and marketing infrastructure.

It is therefore recommended that:

- All cashew infrastructures must include the requisite waste disposal or handling systems.
All nurseries should be equipped with appropriate latrines located away from boreholes.

It is important that stakeholder organisations such as farmers, Zambia Environmental Management Agency (ZEMA), Forestry Department, local NGOs/CSOs and other interested partners participate in ESMP implementation.

Reduction and control of noise levels to minimize any disruption to the living conditions of wildlife should be strictly adhered to.

The vegetation clearance should be confined to the absolutely necessary part, and buffer strips should be maintained and huge indigenous trees in the areas should be preserved as much as possible.

Labour intensive methods should be encouraged as they benefit the local community in terms of job creation. For this, the project should employ local workers as much as possible to ensure that most benefits remain in the area where development is taking place.

During road rehabilitation, the use of destructive machinery, which adversely affect soils and undergrowth, should be avoided as much as possible.

Avoid any sites which are of archaeological importance, ceremonial shrines or sacred. In case of any natural and cultural heritage chance finds, the “chance finds procedure” should be employed unreservedly.

In general the project is environment friendly and the implementation of SESA proposed mitigation measures will improve the conditions of project success.

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