

**Environmental and Social Review Summary**

**For**

**Uganda**

**Renewable Energy Development Program – Nyamwamba  
Hydropower Project**

**January 2014**

## **Environmental and Social Review Summary**

**Country: Uganda**

**Project Name: Renewable Energy Development Program– Nyamwamba Hydro Power Project**

**Project Number: P133318**

**Environmental Category: B**

### **Project Description**

The proposed Series of IDA Partial Risk Guarantees for the Renewable Energy Development Program (IDA PRG Program) will support private sector investors to develop renewable energy based power plants in Uganda under the approved Renewable Energy Feed in Tariff (REFiT) structure. To create an enabling environment for private sector investment in renewable energy, the GoU is working with IDA and other development partners to introduce following instruments to enhance the market. These are: (i) Global Energy Transfer Feed in Tariff (GET FiT) Premium Payment, and (ii) IDA PRG Program. While these instruments will be offered independent of each other, and will be supported by different institutions, these will jointly work to enhance the renewable energy market development in Uganda.

There are more than 40 subprojects that have already been identified that could be developed under the REFiT policy and considered within the proposed IDA PRG Program. These subprojects are at different stages of preparation. Lack of credit risk mitigation under the Power Purchase Agreement (PPA) and Implementation Agreement (IA) had been the major challenge to raise financing for these projects.

The proposed IDA PRG Program will support and complement other efforts promoting small renewable energy development in Uganda that are being supported by a number of bilateral and multilateral parties, in particular, the GET FiT program, being coordinated by KfW.

The GET FiT program is planned to support implementation of renewable energy based subprojects under the REFiT program. Based on agreed eligible criteria, renewable energy subprojects will be selected to receive GET FiT Premium payments. This will be a result-based top-up on the REFiT in Uganda on a per-kWh-basis, designed to cover the gap between the current REFiT levels and the Levelized Cost of Electricity (LCOE), thus enhancing subproject's financial viability. Payments will be availed on a grant basis.

**Nyamwamba Small Hydropower Plant (NSHP):** The proposed Nyamwamba Small Hydropower plant with an installed capacity of 9.2 MW, is located in the township of Kilembe in South-West Uganda on the Nyamwamba River, approximately 60 km south-southeast of Fort Portal and some 270 km West of Kampala. Kilembe is located on the lower slopes of the Ruwenzori Mountains and east of the Ruwenzori Mountains National Park. The project site is located on modified habitat with the proposed alignment of the headrace canal on cultivated land on the steep valley slope and the construction of the diversion weir, penstock and powerhouse on the valley floor in the town of Kilembe.

The run of the river project will consist of a flow diversion weir and a 1km long headrace channel leading to a fore-bay tank which is to be located at a slightly lower elevation. From there the water will be conveyed down the hillside to the powerhouse using a 2km penstock pipe, mostly buried below ground. The powerhouse is proposed to be located on the right bank of the river, by

the side of the main Kasese-Kilembe Road. In addition, the project will construct a substation, a control room, relay rooms, workshop and storage facilities, office accommodation, operator's facilities and other necessary facilities for the operation and maintenance of the Power Station.

The weir at the selected downstream location will have a maximum height of 2 meter and length of about 20 meter. For the weir, an ogee type of shape in plumb mass concrete is proposed. The flow diversion weir will be a straight gravity weir of concrete and having a wide strip. The intake structure is a reinforced concrete closed conduit type structure which can function even under high flood conditions at site.

The headrace canal conveying water from the stream will lie on the left bank of the stream. This bank has moderately steep slopes, and the ground is deeply weathered. As such, it would be unwise to carry out excessive excavation for location of the headrace canal. Headrace channel carries water from the flow diversion weir to the fore-bay tank and is a vital component in the hydropower scheme design. In order to minimize excavation and damage to the slopes, a reinforced concrete rectangular channel is recommended. The channel will be placed on excavated slopes, on a minimum 50 mm thick screed, and adequate drainage will be provided to convey storm water past the channel. Due to the long canal length and the very high hydraulic design slope of the canal, it is proposed that an elaborate pipe spillway be incorporated at the end of the canal closer to the fore-bay. The canal walls from this point up to the fore-bay will be maintained level in order to prevent channel overspill from other locations.

The fore-bay will be of reinforced concrete. A trash screen will be built in approximately 8 meter before the penstock entry, to prevent debris, stones and other material from entering the penstock. The top of the fore-bay will be covered with a top slab, beyond the trash screen, to prevent accidents and efforts of sabotage. The spillway will be located at the intake itself, so that all water spilling will be fed into the river. The penstock will comprise of two welded steel pipes, approximately 2 km long which will convey water from the fore-bay into the turbines.

Africa EMS Nyamwamba Limited is a limited liability company incorporated in Uganda on 20th May 2011. It intends to develop a hydropower project on River Nyamwamba in Kilembe, Kasese District, Western Uganda. All the power will be sold to the Uganda Electricity Transmission Company Limited (UETCL).

### **Key Issues**

The World Bank's assessment considered the company's management of its environmental, social, health and safety performance in the establishment and operation of its facilities; compliance with national and local permitting requirements; and the company's engagement with local communities regarding environmental, health and safety performance. The most critical social impact identified in the ESIA is the land acquisition and the resultant impact on livelihoods of those depending on agriculture. The Environmental and Social Impact Assessment (ESIA) was approved by NEMA in September 2010. It is the main source document which outlines strategies to mitigate the likely environmental and social impacts. Since the NEMA clearance of the ESIA, the project area has been hit by a severe flood resulting in the design change in response to the flooding. It should also be noted that the proposed NSHP is smaller than the 14 MW facility envisaged in the original ESIA. The sponsor will be required to update the environment and social documents to reflect the changes due to flooding. In the meantime, the World Bank has undertaken environmental and social due diligence to check any major changes to the assessed impacts.

The number of potentially affected families whose lands will be impacted due to the project structures will be around 92 (ninety two). The construction of facilities is estimated to require a total of around 7.5 hector of land, this is a collective total of very small parcels of cultivable land from the front yards of households, mostly temporary, to lay down the 2 km penstock pipe from the weir to the powerhouse, mostly buried below ground. The relocation of homes will only be required for 2 permanent houses and potentially two semi- permanent along the fore-bay area and the penstock path. Several households will be temporarily affected during construction period by way of loss of compounds, toilet pits, play area, etc. which can be replaced.

Most of the social and environmental impacts of the project will be during the construction phase of the project. It is assumed that the construction phase of the project will continue for a period of more than two years from its commencement. The scale of the construction work of NSHP is considered to be reasonably heavy and will involve large amount of earthworks (excavation, transport of spoils, cut and filling, removal of boulders etc). Construction will be both extensive in terms of the area covered and intensive in terms of the nature of the topography that is to be dealt with and the presence of human activities. Excavation of over one and half kilometers along the steep slopes of land with agricultural lands and human habitation on either side has been earmarked for the construction of the headrace canal. Further excavation also will be needed along nearly a two kilometer stretch of gentle slope parallel to the main roadway most of which will require substantial modification of the existing landscape to prepare for the burying of the penstock pipes. This area is heavily modified and occupied by houses, agricultural land, community and other infrastructure facilities such as community clinics, hospitals, and schools, water conveying pipes, septic tanks, play areas, access paths and drainage systems. As such, the impacts will occur mainly during the construction phase.

The following Performance Standards apply to the project:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labor and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety, and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 8: Cultural Heritage

### **E&S Categorization Rationale**

This is a category B project according to WB Procedure for Environmental and Social Review of Projects because a limited number of specific environmental and social impacts that may result have been, or are being, avoided or mitigated by adhering to generally recognized performance standards, guidelines or design criteria.

### **Key Information Sources**

The ESIA, ESMP, ESAP and RAPs were finalized in 2010 and will be updated to take into account the gap of three years and impact of the floods of May 2013.

The key documents reviewed by the Bank team included:

- Environmental and Social Impact Assessment April 2010
- Environmental and Social Management Plan March 2012
- Abbreviated Resettlement Action Plan December 2010

A site visit by environmental and social specialists in May 2013 along with the GET FiT counterparts included meetings with the project sponsors. Based on this review and due diligence, the project is expected to comply with Bank Performance Standards and relevant WBG Environmental, Health, and Safety Guidelines (EHSGs).

### **PS1: Assessment and Management of Environmental and Social Risks and Impacts**

Detailed Environmental & Social Impact Assessment (ESIA) and Environmental & Social Management Plan (ESMP) have been prepared by South Asia Energy Management Systems Inc. (SAEMS) in 2010 to comply with the standards set by the National Environment management Authority (NEMA), the Ugandan agency in charge of environmental protection, applicable laws of the Republic of Uganda (The Constitution of the Republic of Uganda, 1995, the Land Act, 1998, the Land Acquisition Act, 1965 and the Electricity Act, 1999) and the World Bank's Performance Standards.

The EIA Certificate of Approval No. 0003548 has been obtained in the name of the Shareholder, East Asia Management Systems Inc. In addition, the Company has obtained Environmental Permit, Certificate No. NEMA/EIA/3548, issued on 23th December 2010; Surface water abstraction permit, KSE400919/1SWHDW 2013, issued 21st May 2013; and Construction Permit, KSE400922/7CPHDW 2013, issued 21st May 2013.

The ESIA, ESMP and the RAP for the project were completed in 2010. The Bank has undertaken due diligence of the environmental and social risks. Though these documents adequately identify the impacts and recommend appropriate mitigation measures, the sponsor will be required to update these documents to reflect the changes that may have occurred in the ensuing three years, especially to reflect the impact of the May 2013 floods as well as the fact that the hydropower facility is small than what was envisaged in 2010. The 2010 RAP identifies a total of 7.6 hector of land to be acquired affecting about 92 households, including 4 physically displaced households and 89 potentially economically displaced. The acquisition of this land will be permanent for the construction and operation of the intake canal; canal spill way; main canal intake gate; open head race canal; fore-bay; fore-bay spill way; penstock and power house. In addition, approximately 2.5 acres of land will be temporarily occupied by the contractor for construction purposes.

The project will affect a total length of 3.25 kilometers. The project will utilize a small weir diverting water at Kyanjuki village to the left bank into a headrace canal. The canal will have a length of 1.05 kilometers and penstock length of 2.2 kilometers delivering water to the powerhouse below Kilembe hospital. The powerhouse will be located 30 meters from the river where a tailrace will be constructed. The project construction and operation will require a permanent land take of 7.6 hector to which current land users will lose right of access. The temporary land needs for construction purposes has not yet being identified. The Project will acquire about 10 meter for the biggest part of the penstock (1.5km) consisting of a 5 meter center right of way (ROW), within this ROW, 2 permanent and one semi-permanent residential houses will be removed and relocated when construction commences. The demolition and relocation of

these homes is reflected in the RAP. While there are no business structures that are going to be affected by the project, some significantly big private eucalyptus plantations and other trees would be affected. In addition, there will be temporary need for land for the contractor's camps, access road and waste disposal. Owners and occupants of this land will be paid rent for the temporary use of their land. Where crops or structures are damaged, compensation will be paid.

The ESIA provides a thorough review of the environmental and social conditions prevailing in 2010 within the Project area, identification of potential impacts by their magnitude, extent and duration, detailed review of impact mitigation measures to be undertaken by the Project proponent. The ESIA also provides a detailed Environmental & Social Management Plan (ESMP) that provides a framework for baseline, compliance and impact monitoring and reporting during the construction and operations of the project.

The ESMP and ESAP lays out a clear approach and plan for environmental and social monitoring to compare the pre- and post- project situations and measuring relevant environmental impacts against baseline conditions. The developer (SAEMS) will undertake the necessary monitoring measures for short- and long-term monitoring program respectively. Much of the work during the construction stage will form part of the contractor's routine inspection activities and will be included in the construction contract. Environmental Audits will be conducted annually and reports submitted to NEMA for review throughout the lifespan of the project.

The developer will include: i) the Environmental and Social Monitoring Plan in all contractor bidding documents and construction contracts, ii) will update the ESMP as required, during project construction and operation, (iii) coordinate all environmental & social monitoring activities, and (iv) submit environmental monitoring reports (including physical data) to NEMA semi-annually during construction and annually for 2 years after completion of construction. At the district level, the District Environment and Natural Resources will monitor the project.

A Project Environmental Management Unit (EMU) will be established at project site to monitor construction activities and the implementation of the project's Environmental Management Plan and the Resettlement Action Plan.

## **PS2: Labor and Working Conditions**

Precautionary measures on occupational safety and health have been stipulated in the Health & Safety & Environmental Management Plan in the overall Environmental and Social Management Plan in accordance with The Occupational Safety and Health Act, 2006<sup>1</sup> and the World Bank's EHS Guidelines. All unskilled, semi-skilled as well as skilled persons if available locally, are to be contracted from within the community, with provision for transfer of technology and expertise. The sponsor will contractually require that all construction contractors and subcontractors respect Ugandan labor laws, including the Workers Compensation Act and the Occupational Safety and Health Act of 2006 that consolidates and harmonizes the law relating to occupational safety and health.

Worker awareness and training program shall be carried by the EMU experts on environmental related matters especially on soil erosion control, waste management and on health risks associated with the HIV/AIDS pandemic. The Contractor will secure liability insurance to cover

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<sup>1</sup> The Employment Act (2000) and Employment Regulations (1977), the Workers' Compensation Act (2000), the Labor Unions Act (2006) and Labor Disputes (Arbitration and Settlement) Act (2006).

for injuries and ill health of employees. This will include insurance for accidents involving vehicles and third party and building insurance.

The Project will ensure contractor compliance with good industry practice occupational health and safety (OHS) standards during the construction period through regular monitoring of worksites and contractor OHS training as required.

### **PS3: Resource Efficiency and Pollution Prevention**

ESIA studies identify erosion and sedimentation of the river among the key issues that require adequate management, especially during the construction phase when significant volume of earth works will have to be carried out in steep terrain. Erosion and sedimentation management measures are well understood and readily available. ESMP contains the necessary mitigation measures consistent with the WBG Environment, Health and Safety Guidelines.

ESIA studies identify, and the ESMP include measures to address potential for water pollution from accidental spills of fuels and lubricants used during construction; domestic and construction waste that will be generated; disposal of spoil; dust and noise pollution, and other impacts common to civil works. Considering the degraded environment in which the project is located, the risks stemming from these activities are relatively low.

Like the other small run of the river projects supported by the PRG, the project is not expected to lead to a significant increase of greenhouse gas emissions, although some incremental emission will occur from the use of construction machinery.

### **PS4: Community Health, Safety, and Security**

The community health, safety, and security are well addressed in the reviewed documents. The ESIA adequately anticipates community health and safety issues from both routine and non-routine circumstances. The main health and safety risks are potential construction related accidents, diseases such as HIV AIDS, Malaria and exposure to electrical hazards, noise, and general accidents. However, potential emergency situation associated with unplanned events such as natural disasters, dam breaks, and/or seismic activity have not been addressed; related preparedness and response plans will be prepared and communicated in advance through adequate Emergency Response Plans to the adjacent communities (e.g. for a dam break). The ESMP has a robust Community Health and Safety and Security Plan to ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

The ESMP includes a Health and Safety Management Plan. The designated Safety Coordinator will be responsible for the implementation of the HSMP while the Social and Environment Manager will have responsibility of verifying its implementation. All supervisors are to be sensitized and trained on how to achieve the plan.

The Project's EMU will ensure contractor compliance with good industry practice occupational health and safety (OHS) standards during the construction period through regular monitoring of worksites and contractor OHS training as required.

## **PS5: Land Acquisition and Involuntary Resettlement**

The developer has prepared an adequate Abbreviated Resettlement Action Plan in 2010; this is in compliance with the Land Act of 1999, the Land Acquisition Act of 1965 and the Electricity Act of 1999 and the World Bank Performance Standards. The social and environment documents prepared in 2010 will be updated to reflect the changes that may have occurred since 2010 and the impact of the floods of May 2013. Land acquired for the construction and operations of the power plant includes: the access roads, area to be occupied by the dam and the area impounded by the dam, area to be acquired for the low pressure pipes, the fore-bay and the spill way, the high pressure pipes, the power house and office structures and the transmission line.

The 2010 Abbreviated RAP indicates a total permanent land take for the project of 7.6 hector affecting 92 households and a temporary disturbance of 1 hector. The relocation of homes will only be required for 2 permanent houses and potentially two semi- permanent homes along the fore-bay area and the penstock path. The RAP does not reflect the location of the construction camp or the impact of the temporary land take to assess the compensation to the owners and occupants. While there will be no transfer of rights in this case but damaged or loss of crops or other assets will have to be compensated if any. While the number of PAPs appears not to have increased, with the lapse of three years, the RAP will be updated to reflect the revised baseline, redefined requirements for land acquisition, new valuations for full replacement cost, improved livelihoods interventions and compensation procedures for impacts.

The land required for the Project is obtained from Kilembe Mines Limited on a sub- lease basis. An offer for a Sub-lease has been made to East Asia Energy Management Systems Inc. by Kilembe Mines Limited for a portion of land equivalent to 7.7 hector on which it intends to establish the Project. The developer has obtained formally agreements from the Ministry of Energy and Mineral Development and the Uganda Land Commission to lease the land.

The RAP is exhaustive in stakeholder engagement and community participation at the national, district and local levels with the District Land Board, District Land Office, Local Councils, local representatives and sub-county chief, and community members affected by the project.

The Monitoring Plan of the RAP is in conformity with the policies and regulations specified in the Resettlement Action plan. It sufficiently covers the key performance indicators and compensation allocation schedule. The monitoring of the implementation of the resettlement compensation plan internally by the project E&S Management Unit as per the key progress indicators will ensure overall fairness and transparency during the compensation process. This will be produced on a quarterly basis. External monitoring is the responsibility of National Environmental Management Authority at the national level and the District Environment and Natural Resources at the district level.

The Grievance Redress Committee (GRC) and Mechanism has been established to address the problem of PAPs during preparation and implementation of the RAP. The composition of the GRC is representative of the stakeholders including: Village and Land Administration, respected elders, developer, contractor, PAPs and the interested community. The main function of the committee would be arbitration and negotiation based on transparent and fair hearing of the cases of the parties in dispute between PAPs and the developer.

### **PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources**

The project is few kilometers downstream of the Rwenzori Mountains National Park, and falls within the high tropical forest zone, but the project area has been heavily degraded by decades of mining and agricultural activities, and exhibits almost no natural forest vegetation. Nyamwamba River was found to contain only single species of fish with little commercial or conservation value. The ESIA studies noted no species of conservation concern and concluded that the habitats in the project area will be minimally affected by the project. Environmental mitigation measures include provision of minimum flow as established by the Directorate of Water Development.

### **PS8: Cultural Heritage**

The socio-economic survey results do not reveal any impacts resulting from the proposed project on spiritual and other cultural assets within the project area. The RAP identifies two earth graves in residential compounds. The mutually agreed mitigation with the owners in relocating graves and compensated for removal in accordance with the local customary practice is adequate.

### **Access to Client Documentation**

The Bank disclosed locally and in the InfoShop the following key documents for the Nyamwamba Hydro Power project:

- Environmental and Social Impact Assessment April 2010
- Environmental and Social Management Plan March 2012
- Abbreviated Resettlement Action Plan December 2010

The following listed documentation is available electronically on the client's website <http://southasiaems.com/news-media/events-presentations>.

- Environmental and Social Impact Assessment April 2010
- Environmental and Social Management Plan March 2012
- Abbreviated Resettlement Action Plan December 2010

## **The Environmental and Social Action Plan Nyamwamba Hydro Power Project**

1. Update the existing ESIA and RAP for Nyamwamba prior to the effectiveness date, reflecting the revised baseline and any other socio-economic changes, and will include the impacts of workers camps, storage areas, and material source points such as quarries
2. Based on the updated ESIA, revise the ESMP to reflect changes that may have occurred in the past three years.
3. Prepare an Emergency Preparedness and Response plan and communicate it in advance to the project affected and adjacent communities
4. The updated RAP to be prepared through a consultative process to provide another opportunity for stakeholder and public comment on the project.
5. The updated RAP to seek clarity on the unsettled claim of the PAPs on the land now owned by the Kilembe Mines, which is to be acquired by the project. The RAP consultation identifies a potential conflict between the right of ownership between the PAPs and the Kilembe Mines Ltd, a Government parastatal with 99% ownership. Kilembe mines subleased this land for 99 years from 1954 to 2050 with a hope of mining copper. However this came to a halt in late 1970s when the copper mining was stopped. This has been obtained by the Developer on a sub-lease basis. The RAP must clarify this issue with the community and KML.
6. Set up an Environmental Management Unit (EMU) with clear roles and responsibilities, relevant expertise including a community relations manager and assign a sufficient budget to manage the E&S tasks and community relations satisfactorily.