

## Environmental and Social Data Sheet

### Overview

Project Name:	<i>JJI MULEMBWE HYDROPOWER</i>
Project Number:	<i>2013-0366</i>
Country:	<i>BURUNDI</i>
Project Description:	The Jiji and Mulembwe Hydropower project consists of the construction of two run-of-the-river hydropower plants Jiji (31.5 MW) and Mulembwe (16.5 MW) in southern Burundi as well as an 80 km 110 kV transmission line to evacuate the power to the capital, Bujumbura, which is interconnected at a national and regional level. The project will increase the supply of clean and affordable electricity to the national grid. The project also includes the electrification of rural communities in the vicinity of the power plants.
EIA required:	yes
Project included in Carbon Footprint Exercise <sup>1</sup> :	yes

### Summary of Environmental and Social Assessment, including key issues and overall conclusion and recommendation

The Jiji Mulembwe Hydropower project will be implemented at a number of different locations, including: the 2 dam sites and power plants on the Jiji and Mulembwe Rivers; construction camps and quarries in close proximity to the works; the routes of transmission lines connecting the power plants to the grid; and access roads. The main social and environmental impacts relate to the relocation of project affected persons (PAPs) and the acquisition of agricultural land at the reservoir sites and along the transmission line routes. Flooding of the relatively small storage reservoirs and change of use of the land acquired for construction of the project facilities will result in some loss of income to the local population. Compensation for land that is compulsorily acquired may be challenging as population density in the area is high and the availability of agricultural land is limited. It is estimated that a total of 936 households will be affected, of which 221 will require physical resettlement; this estimate will be refined following detailed transmission line route surveys. No households are expected to be relocated outside of the areas in which they currently live. There are no indigenous people living in the project area. The promoter will establish a grievance redress mechanism to ensure that any ongoing concerns by affected persons are appropriately addressed. The project will require a significant influx of construction workforce and this will carry the risk of the spread of HIV/AIDS and other communicable diseases. The diversion of the rivers at the dam sites will affect downstream hydrology and ecology; however, a minimum flow will be released at all times from both dams in order to protect the aquatic environment immediately downstream. The impact of reduced water flow is mitigated by the presence of tributary streams a short distance downstream of the dam at both sites.

The two hydropower schemes and the associated transmission lines and substations have been subjected to a full environmental and social impact assessment, including public consultation, and Environmental and Social Management Plans (ESMPs) and preliminary Resettlement Action Plans (RAPs) have been prepared and will be updated once the detailed design and routing of the transmission lines and access roads has been completed, prior to the start of any resettlement activities. The project was assessed against World Bank environmental and social operational policies and will be required to comply with the Bank's environmental and social standards. The negative impacts of the project are manageable and can be mitigated by the measures defined in the ESMPs and RAPs. The project is not expected to have a significant negative impact on any protected or endangered species or on any protected or environmentally sensitive areas. An Environmental and Social Management Unit has been created to oversee implementation of the ESMPs and RAPs, and will be supported by a suitable qualified and experienced international consultant. An independent Environmental and Social Panel of Experts will be appointed to provide advice on environmental and social issues. The promoter

<sup>1</sup> Only projects that meet the scope of the Pilot Exercise, as defined in the EIB draft Carbon Footprint Methodologies, are included, provided estimated emissions exceed the methodology thresholds: above 100,000 tons CO<sub>2</sub>e/year absolute (gross) or 20,000 tons CO<sub>2</sub>e/year relative (net) – both increases and savings.

has prepared dam safety instruments including a Construction Supervision and Quality Assurance Plan and a Preliminary Operation and Maintenance Plan. Design and construction of the hydropower schemes will be overseen by an independent Dam Safety Review Panel. The appointment of both independent expert panels will be required as a disbursement condition under the Bank's loan agreement.

The project is expected to have significant direct and indirect environmental and social benefits, including a reduction in the emission of greenhouse gases and other atmospheric pollutants from alternative oil-fired diesel generator units. Access to clean and affordable supplies of energy from the project will provide economic and health benefits to the local population, with positive impacts for women in particular. The project will also create short-term employment opportunities for the local population during construction, mostly for unskilled and semi-skilled labour.

Overall, the project is considered to be acceptable for Bank financing from an environmental and social perspective.

## Environmental and Social Assessment

### Environmental Assessment

The promoter has prepared the following environmental and social safeguards documentation: three Environmental and Social Impact Assessment (ESIA) reports, including one for each of the two hydropower schemes and one for the transmission lines and substations; an Environmental and Social Management Framework (ESMF) covering the electricity supply to local communities; a Resettlement Policy Framework (RPF) covering the overall project ; and three preliminary Resettlement Action Plans (RAPs) for the two plants and the transmission lines and substations. These documents have all been submitted for public consultation and have been approved by the competent national authority<sup>2</sup>. An environmental compliance certificate was issued on 09/12/2013. Riparian notices were sent to DRC, Zambia and Tanzania on 28/01/2014. Zambia responded on 24/02/2014 and expressed its support for the project; however, the deadline for responses of 28/02/2014 was passed without any notice being received from DRC or Tanzania and tacit approval has been assumed.

The ESIA's indicate that project's impacts on the environment are generally modest, with the most significant being those relating to changes in land use affecting the local population. There is very little plant biodiversity in the project area, with almost all the land being cultivated or temporarily fallow. Ligneous flora consisting of bushes and shrubs is to be found mainly along natural watercourses. There is no longer any forest formation; the tree cover that does exist is mostly in the form of isolated specimens and consists mainly of oil palms and eucalyptus planted to produce firewood.

Terrestrial animal biodiversity is extremely poor owing to the heavy human pressure in the area and the fact that almost all rural land is cultivated. In particular, this involves seasonal burning of dried crop residues, which is a major limiting factor for the development of terrestrial fauna. Aquatic fauna in the river around the development site is also poor, being limited to a few species of small fish that are common to other rivers in the country and in Lake Tanganyika, with no commercial value. No migrating species were identified during the ESIA studies or reported by local residents. The villagers do not fish in the river other than occasionally during floods. All fish eaten in the project area come from Lake Tanganyika. No migration corridors for birds have been identified as potentially crossing any of the transmission line routes.

No site of cultural value was identified in the project area during the ESIA field visits or reported by residents; however, should any chance discovery be made during earthworks, a procedure for immediately halting the works will be introduced to secure, protect and conserve any physical cultural resource found.

The hydrological regime affecting the 2 hydropower schemes has been assessed on the basis of flow measurements collected on the Jiji and Mulembwe rivers during the period 1981-2009, correlated with rainfall data collected at several meteorological stations in the area since 1970. The analysis indicates that the flow regime in the 2 rivers is relatively stable, albeit with a strong seasonal variation, and the hydrological records are sufficient to be able to provide a sound basis for the design of the hydropower schemes. Records over the study period indicate a tendency for flow to reduce slightly, which could be explained by climate change or alternatively by the drying out of marshland in the watershed. A large portion of the water in the Jiji and Mulembwe Rivers during the dry season is sourced from marshes upstream of the dam sites. These marshes, which act as a water storage reservoir during the wet season, have been at risk of drying out due to the progressive taking over of land for agriculture by the local population. This has the consequence that the capacity of the marshes to regulate the seasonal

<sup>2</sup> Ministère de l'Eau, de l'Environnement, de L'Aménagement du Territoire et de l'Urbanisme

flow regime is reduced. The government has implemented measures to protect the marshes in this area and has created a protected area to prevent further agricultural encroachment.

### **EIB Carbon Footprint Exercise**

The project will supply renewable energy to the national grid and thereby avoid the emission of greenhouse gases from alternative oil-fired generation, which in the case of Burundi is likely to be from oil-fired diesel generators. Given the small storage reservoirs associated with the two run-of-the-river hydropower schemes included in the project, emissions of greenhouse gases during construction and operation of the project are expected to be relatively small. On the basis of a total reservoir surface area of 35 000 m<sup>2</sup> and an installed capacity of 48 MW<sub>e</sub>, the project has a power density of 1 371 W/m<sup>2</sup>; according to the threshold values promulgated by the CDM Executive Board, greenhouse gas emissions from the reservoirs of hydroelectric power plants with a power density of greater than 10 W/m<sup>2</sup> may be neglected when accounting for net emissions for CDM purposes. Estimated emissions savings are 177 ktCO<sub>2</sub>e/a. For the annual accounting purposes of the EIB Carbon Footprint, the project emissions will be allocated pro-rata according to the EIB lending amount signed in that year, as a proportion of project cost.

### **Social Assessment**

Given the population density in Burundi and the fact that the project is located in a relatively fertile agricultural area, it is inevitable that the construction of the project facilities, including the permanent acquisition of land for the dams, reservoirs, powerhouses, access roads, transmission line towers and substations will affect private land currently used by the local population. The component with the greatest impact, by virtue of the area of land required, is the transmission line between the project site and the capital Bujumbura; however, although the total area of the transmission line right-of-way is significant, most of it can be returned to its original use after construction of the line. The design and location of the roads and transmission lines included in the project is not yet precisely defined. The detailed design and routing of these investments will be carried out by the selected contractor, at which point the exact number of persons affected by the project will be determined and the preliminary RAPs for all 3 project components (i.e. the 2 hydropower schemes and the associated transmission lines and substations) will be revised and finalised. According to the preliminary analysis, it is estimated that a total of 963 households will be affected by the project, including 383 at the Mulembwe site, 341 at Jiji and 212 along the rights of way of the transmission lines or at substation sites. In all, some 6 200 persons are expected to be affected, the majority of which will lose the use of all or part of the land that they currently have under cultivation. A total of 221 households are expected to require physical resettlement, including 4 at Mulembwe, 18 at Jiji and 199 along the transmission line rights of way or at substation sites. The preliminary RAPs conclude that no households will be relocated outside the areas in which they presently live, and all will have the option of resettling in the same "Colline" (the smallest administrative unit in Burundi). Slightly over one third of the households affected (363 according to the preliminary estimate) are considered to be vulnerable under the criteria employed for the analysis, which include the poverty level (monthly household income of less than 30 000 FBU), households headed by women or children, the elderly (over 60 years old), agricultural workers with limited land rights, and sick and handicapped people.

The preliminary RAPs include a programme of measures for supporting households affected by the project. Apart from monetary compensation, which will be in line with the requirements of national legislation and will be required to be paid prior to resettlement or the occupation of land, additional support will be provided to ensure an improvement in the general living conditions and livelihoods of those affected and, in particular to increase or at least maintain their income level. The measures include: assistance in increasing agricultural productivity; resettlement support from an appropriate local non-governmental organisation, in particular for vulnerable households; food assistance during the transition period; financial assistance to cover the costs incurred during the resettlement process; and training in financial management in order to ensure a rational use of compensation payments.

Application of occupational health and safety and labour standards during project construction will primarily be the responsibility of the main contractors employed to undertake the works, under the supervision of the Owner's Engineer and subject to regular inspection by the government authorities. Following commissioning of the works, operation of the hydropower plants will be undertaken by an experienced Operation and Maintenance contractor, for a minimum period of 3 years, who will also be responsible for training the promoter's own staff in order to ensure a smooth handover at the end of the contractual period. Special attention will be given to those areas identified by the ILO as being of particular concern in Burundi.

## **Public Consultation and Stakeholder Engagement, where required**

The Jiji and Mulembwe project has been the subject of recurrent discussions and presentations in many fora at local, at national as well as at international levels. Many local and national consultations were conducted during the socio-economic surveys carried out during 2010-2011. The key stakeholders were consulted during the preparation of the safeguards documents, including the ESMPs and the preliminary RAPs. The participants and results of the formal consultation meetings are recorded in the respective reports. The ESIA reports and the ESMF have been disclosed in public administration centres in the local area and on the promoter's website since mid-December 2013.

The main topics addressed during the public consultation meetings were the scope of the project, the benefits for the country and the region, compensation procedures for people whose buildings or land will be affected by the project, other measures to be provided to assist with resettlement, and grievance procedures. Two public workshops were held in Bujumbura during 2013: an inception workshop on 23/08/2013 and a workshop presenting the draft ESIsAs and preliminary RAPs on 18/10/2013. In general, the participants in these workshops and in the local consultation meetings confirmed their interest in and support for the project. A Stakeholder Engagement Plan shall be developed to guide the engagement and disclosure of the ESMPs and specific plans defined under the ESMPs as well as for the final RAPs with the relevant stakeholders.

## **Other Environmental and Social Aspects**

An environmental and social management unit (ESMU) has been created within the promoter's Project Implementation Unit (PIU) to oversee implementation of the ESMPs and the final versions of the RAPs. The ESMU will be staffed by two safeguard experts (one Environmental Specialist and one Social Scientist) and will be supported at the start of the construction period by a full-time senior international consultant with confirmed experience in both environmental and social safeguards. An Owners' Engineer will be recruited to assist the PIU in coordinating the implementation of the ESMPs and RAPs and will be responsible for field supervision and preparation of monthly progress reports. Implementation of the ESMPs and RAPs will be supervised by an International Panel of experts comprised of environmental and social safeguards experts with qualifications, experience and terms of reference acceptable to the Bank.

Local resettlement committees (comités locaux de réinstallation – CLR) will be established to assist the promoter at the local level, including representing project affected people during negotiation of compensation payments, identifying suitable resettlement sites, supporting any local people wishing to lodge complaints or grievances, identifying any vulnerable people affected by the project. The CLRs will cooperate with NGOs to be recruited by the promoter to assist with implementation and monitoring of the RAPs. The project budget includes appropriate allowances for funding the above initiatives.