

## Environmental and Social Data Sheet

### Overview

Project Name: LOM PANGAR  
 Project Number: 20060488  
 Country: CAMEROON  
 Project Description: The proposed Lom Pangar Hydropower Project (LPHP) consists of a regulating dam, a hydroelectric power plant at the foot of the dam, and a transmission line between the power plant and the Eastern Grid, to facilitate a rural electrification scheme along the transmission corridor. Associated investments include the adaptation of the Chad-Cameroon Pipeline, which is outside the scope of this project per se, but required for this project to come to fruition. The dam will be located on the River Lom in Cameroon's Eastern Region, about 4 kilometres downstream of the confluence with the Pangar River and 13 kilometres upstream of the confluence with the Sanaga River.

EIA: Required ☒  
 Not required ☐

Project included in Carbon Footprint Exercise<sup>1</sup>: YES

(Details are provided in section: "Carbon Footprint")

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

A project of this kind will have significant environmental and social impacts and risks, including: (i) the partial flooding of the Chad-Cameroon pipeline; (ii) the loss of natural habitat due to flooding and infrastructure footprint; (iii) the risk of reducing the viability of a distinct population of gorillas and other red-listed species; (iv) the risk that construction activities will induce significant loss of natural habitat; and (v) the predictable environmental, human and health risks associated with the construction and operation of any large infrastructure in a previously low density area.

An Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) have been prepared to address and mitigate the environmental and social impacts of the construction sites, reservoir and downstream areas, and wood salvage. The ESIA and ESMP also address the sustainable management of the Deng Deng National Park (DDNP) and the Deng Deng forest. The project has triggered all the lenders' safeguard policies which take into account the lessons learned and recommendations made by the World Commission on Dams. Environmental and social aspects of these have been incorporated into the ESMPs and appropriate conditionality will be included in the finance contract. The assessments and associated measures are in line with the lenders' (World Bank, AfDB, EIB and AFD) safeguard requirements.

<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.

Note, however, the Promoter has limited experience in coordinating, implementing, monitoring, and enforcing the measures as defined in the various plans. This is compounded by the lack of experience of the construction contractor in working towards international standards and complexity of the implementing arrangements associated with various government departments (MINFOF, MINEPIA, MOH). These aspects are mitigated through a package of technical assistance being provided as part of the project, and the conditionality below:

The finance contract will include disbursement conditions as follows:

- Construction contractor to strengthen its team dealing with E & S issues;
- A panel of environmental and social experts is re-established or re-instated immediately and the ToRs of this panel agreed by the Lenders;
- An external auditor for the E&S monitoring on behalf of the Lenders is appointed as soon as possible.

## **Environmental and Social Assessment**

### **Environmental Impact and Mitigation**

Under the Cameroonian institutional and regulatory framework for the management of environmental assessments (EAs), all large projects, such as the proposed LPHP, are subjected to EAs that must be reviewed by the Inter-Ministerial Committee on the Environment, subjected to public hearings, and resulting in a certificate of compliance issued by the Minister of Environment and Nature Protection. A certificate of compliance for the LPHP project, based on the Environmental and Social Assessment was issued by the Minister of Environment and Nature Protection in 2011.

Since 2000, the Promoter, Electricity Development Corporation (EDC), with support from AFD and the World Bank, has been preparing a comprehensive set of environmental and social studies for the LPHP project. These include:

- An Environmental and Social Impact Assessment (ESIA) report, the Environmental and Social Management Plan (ESMP), and accompanying annexes covering for instance sustainable fishery management, archaeological resource management, public health management, pesticide management, and the construction ESMP;
- Additional environmental and social studies, including a cumulative impact assessment, forestry study, study on the critical habitats, study on vulnerable people of the Peulh/Mbororo tribe and land use study for the new village of Lom Pangar;
- the Resettlement Actions Plans (RAPs) for the dam, the transmission line/power plant, the access roads, and an abbreviated RAP for the Deng Deng National Park (DDNP) resettlements; and
- A process framework for the Deng Deng National Park.

In addition, with respect to the associated infrastructure (the adaption of the Chad-Cameroon pipeline), COTCO has carried out a Specific Environmental and Social Impact Assessment for adaptation works and updated the Area Specific Oil Spill Response Plan (ASOSRP), applying IFC Performance Standards.

The environmental and social assessments and related documents have been produced by reputable international environmental and social consultants. All these documents have been through an extensive review process by experts from the World Bank, AFD and EIB. In addition, two panels of independent, internationally-recognised experts have been appointed by the Promoter and have been operational since early 2005, (with an interruption from 2006 to 2008, due to budget constraints) to accompany and supervise project preparation in line with best practice and World Bank safeguard policies. The environmental and social panel comprises an environmental expert, a public health expert and a social expert. The dam safety panel comprises a geologist, a dam safety specialist, a hydrologist and a hydro-mechanical engineer.

These ESIA, ESMP, RAPs and associated documents possess all the relevant measures to limit the environmental and social risks related to this project. All the documents are accessible on the Promoter's website ([www.edc-cameroon.org](http://www.edc-cameroon.org)).

### **Impacts on Biodiversity**

Besides the typical direct impacts and risks associated with civil works and new construction (air and noise emissions, wastewater, solid and hazardous waste generation), these construction activities will equally have indirect and induced impacts. These impacts will come from the areas hosting the labour force adding pressure on already insufficient infrastructure and services (i.e. health, education and community safety). The construction works could result in an influx of population which would increase the pressure on natural resources and would lead to an encroachment of the forested areas by agricultural activities.

The reservoir will be flooding an area of approximately 537 km<sup>2</sup> of natural habitat, of which 300 km<sup>2</sup> is natural forest. The project also includes wood salvage from the future reservoir of approximately one million m<sup>3</sup>. The induced impacts on the natural environment could be significant in the long term, reducing the integrity and ecological functions of the forest, loss of biodiversity increasing the risk of poaching, fragmentation of habitats due to access roads and the extension of agriculture to forested areas. The reservoir will transform a terrestrial ecosystem of forest and savannas along a river into a lake ecosystem subjected to strong seasonal variations.

While the ESIA indicates that none of the flooded terrestrial habitat is critical, the dam is located next to portions of the Deng Deng forest that include critical habitats, particularly because of the presence of a viable population of gorillas (on the IUCN Red list and listed as critically endangered) and a significant population of chimpanzees.

A gradual degradation of the Deng Deng forest could lead to the extinction of its gorilla population. Therefore the creation of the DDNP will not only offset the direct environmental footprint of the project, as well as the loss of natural habitat as a result of the reservoir, but will also contribute to the viability of the gorilla population of Deng Deng (and that of the chimpanzees) even though the identified gorilla population is not limited to the Park. Given the proximity of the dam construction site, the increased number of access roads and the influx of workers to the area will have significant negative impacts on the primate population. Following a study carried out by the Wildlife Conservation Society, the project has acknowledged the risk and has also planned to modify and increase the perimeter of the DDNP, providing buffer zones between the park and the settlement areas and the access roads, establishing corridors to allow for the free movement of the primates between the Parc and the habitat areas not included in the Park. The Ministry of Forestry (MinFOF) will have to put into place a park management team and its monitoring capacity to ensure the adequate protection of the gorillas. Under the Project, MinFOF will be required to carry out an ecological baseline of the Park as well as establish and implement a comprehensive management plan. Technical assistance will be provided to support Min FOF in carrying out these specific tasks. A secured financing mechanism, adequate provision of ecoguards, access controls and a management effectiveness tracking tool, most particularly during the dam's construction will be put in place and will be supported during the initial phases through technical assistance.

### **Assessment of Alternatives**

Lom Pangar has been subject to a series of analyses of alternatives in line with Lenders' requirements. A detailed analysis is included in the project's ESIA. The project site and design was selected based on several studies of alternative locations for reservoirs, considering costs and benefits as well as several options for technical suitability. The environmental and social impacts of the project, including associated infrastructure (location of construction camp, quarries, etc...) were assessed to be manageable.

## **Cummulative Impacts Assessment**

Regulation of the Lom River by the dam will have impacts downstream that are cumulative to the modification of the hydrological regime of the Sanaga River by the existing dams. Further developments along the Sanaga River will be cumulative to the Project. The ESMP includes measures that are based in the recommendations in the cumulative impact assessment, including monitoring of downstream ecosystems. A Sanaga river basin management study is being carried out.

## **Environmental and Social Management Plan**

A comprehensive ESMP has been developed for the project, detailing the mitigation measures to be implemented in order to reduce the environmental and social impacts. The ESMP includes (i) management of the construction sites; (ii) management of the reservoir and downstream areas; (iii) social measures; (iv) management of the Deng Deng forest massif. This document is supported by number of specialised studies as well as a cumulative impacts assessment of the Sanaga river basin. All these documents conform to the lenders' requirements. The implementation arrangements of the ESMP are fully integrated with the overall implementation arrangements of the Project. The Promoter has the ultimate responsibility for the project's compliance with Cameroonian legislation and lenders' safeguard policies. The ESMP includes capacity building measures to strengthen, where required, the Promoter's capacity to handle safeguard issues according to international standards.

## **Social Assessment**

The area in and around the proposed project site has been studied extensively from a socio-economic perspective, using a combination of surveys and direct analysis (in particular in the field of health), as well as a review of existing literature. The region has few inhabitants; the most densely populated areas still have less than 10 inhabitants/km<sup>2</sup>. The total population living in the area of influence is estimated at about 30,000 people. According to the baseline information, key livelihood activities in the area include agriculture (practiced by practically all households), sedentary and itinerant livestock keeping, hunting (essentially for domestic consumption), artisanal gold digging, fishing, and the illegal timber trade using the railroad towards North Cameroon.

This project is intended to have positive impacts for the overall development and growth of the country. In particular it will contribute towards meeting the growing energy demand in the region and assure a greater degree of security of supply. The project will create a number of both temporary and permanent employment opportunities through the construction and implementation phases. Sourcing of construction workers from the local labour pool, although being encouraged is likely to be limited to unskilled workers due to the technical nature of the work to be undertaken and low population density of the area.

The expected social impacts of the project have been analysed in detail in the ESIA and rated as major, moderate, minor, and negligible for the different phases of construction and operation. The following section looks at the most important impacts of the project.

**Land Acquisition and Resettlement.** The most significant negative social impact of the project will be land acquisition and the associated economic and physical displacement of people. The proposed project will require about 4,000 ha of direct and permanent land take, including 2,500 ha for the dam construction and reservoir site; 530 ha for the construction of the transmission line; 400 ha for the construction of access roads; 500 ha for the resettlement of the Lom Pangar village; and 70 ha for the access roads for the pipeline adaptation works.

Several RAPs have been prepared to mitigate, offset, and reduce negative social impacts and to strengthen positive impacts on the communities in the project area. The RAPs describe the principles, the measures that will be taken to compensate the project affected persons for their losses, institutional arrangements for implementing the plans, grievance and redress

measures and arrangements for monitoring the implementation. The RAPs have been developed in consultation with the PAPs and are considered to be acceptable in form and substance by the EIB.

Based on the census and socio-economic and asset surveys carried out as part of the RAPs a total of 756 households (3,267 people) (from two villages and twenty eight encampments located in the proximity of the dam site) and 855 households will be affected as a result of the Dam and the transmission line from Deng Deng to Ouami and powerhouse, respectively. A significant majority of these households will be economically displaced (i.e. not losing the primary home). A Decree (No. 2012/0034) regarding compensation of project affected people was signed by the Prime Minister of Cameroon on January 24<sup>th</sup>, 2012. Following on from this, the implementation of the RAPs will begin with the compensation of PAPs.

In addition to the compensation measures proposed in the RAPs, the ESMP also provides other additional measures to restore livelihoods, including agricultural extension services (training on agricultural techniques, seeds, facilitation of market access, animal husbandry and nutrition), support to fishermen, and assistance to artisanal gold miners (e.g. techniques to mine in an environmentally sustainable manner; training miners in new professions).

**Vulnerable and Indigenous People:** According to a social assessment prepared at the project site in February 2010, no pygmies or other Indigenous Peoples, as defined by the World Bank OP 4.10, have been found in the project area. The social assessment noted the presence of members of the Peulh/MBororo tribe in the project area, who mostly engage in herding activities across the whole of the Western Central Africa region. A supplement to the study assessed the project's impact on these groups and adequate compensation measures have been proposed in the social component of the ESMP. These include livelihood support, technical monitoring, and medicine for cattle (veterinary services) and the construction of the Touraké Bridge to allow the herders safe access across the reservoir. In addition, women, the elderly, children, and sick and disabled people who can be considered as vulnerable on account of their limited adaptation capacities, their mutual need for dependency, and/or their fragility or specific needs, have been identified as part of the census and socio-economic surveys and given specific attention and support as part of the RAPs.

**Occupational Health and Safety:** Construction sites related to the project include the main dam and power plant site as well as other sites such as worker camps, bridges and crossings, quarries, roads and service infrastructure. Construction activities in each of these sites could potentially have negative impacts in terms of the health and safety of the workers. Rules and procedures on the management of the construction activities are provided in the Construction ESMP. Construction activities at all construction sites will be carried out in accordance with international standards as described in the Contractor (Contractor or Construction?) ESMP. The mitigation measures have been included as environmental and social clauses in the contract for the dam construction (part of the detailed specification requirements). Similar clauses will be incorporated in all other works contracts. Each contract legally requires the contractor to prepare a Contractor ESMP before starting works. Management of the construction sites aims to minimise impacts on the environment, the workers, and on neighbouring populations.

The dam construction contractor has the contractual obligation for traffic, waste, labour force, environmental monitoring, health and safety, and hazardous materials management. This includes mitigation and management measures to deal with social and health consequences of migrant workers coming into the communities, e.g. risks of development of STI (Sexually Transmissible Infections) and of AIDS, and safety issues from construction traffic.

The Promoter is in the process of establishing a health and safety (H&S) management system that is fully compliant with OHSAS 18001 guidelines. This management system will apply to all construction and operation activities. H&S requirements are also established in the Civil Works Conditions of the Construction Contract, and are also further detailed in the civil works specifications. However, the Construction Contractor will prepare a detailed H&S programme before construction starts which will be based on Cameroonian requirements, Promoter's H&S Regulation and the lenders' requirements adapted to the specifications of the project.

**Community Health:** The project is likely to have multiple impacts on human health associated with the influx of people (both construction workers and those attracted by economic opportunities resulting from the project) and the presence of a large body of water. The health impacts have been the subject of a separate and detailed study as part of the EA of the Project. The health coverage in the area of influence of the project is already insufficient for the existing inhabitants and is unlikely to cope with an influx of more people or increased incidences of diseases. As a result the social component of the ESMP includes a programme of measures to strengthen and improve the health infrastructure (refurbishment or the addition of medical facilities, equipment, medication and personnel) and provide sensitisation and training to the local community and other measures for the prevention of water-borne diseases.

**Labour Standards:** Human Resources Policies: The Promoter has a total staff of approximately 250 people for which it has in place a Human Resources Policy based on Cameroonian regulations, which are aligned with ILO's Core Labour Standards, and it has been updated to reflect lender requirements. On the other hand, civil works, electro-mechanical and other construction services associated with the construction of the dam will require the Construction Contractor and its subcontractors to hire approximately 1,200 workers during the peak construction period. These figures do not include outsourced labour for transportation, catering and other activities. During operations, the Project will require a very limited workforce. Construction work will be undertaken in line with working time regulations of Cameroonian law.

Supply of unskilled and skilled local labour for the construction stage will be maximised to the extent possible through the implementation of a local hiring programme, while at the same time addressing potential induced impacts generated by influx of people looking for jobs at the site. To this end, the local hiring programme will include a strong communications component to manage expectations and to explain the recruitment process which will be conducted through the Project's community engagement activities using direct communication channels. There will be no hiring at the gates of the construction site or campsites. The workers on the dam will be housed mainly in dedicated worker's campsites located within the Project's concession area. The Construction Contractor will be required to implement a Camp Regulations and Worker Code of Conduct, including provision of adequate accommodation facilities in all its campsites in accordance with internationally recognised standards (i.e. space standards for dormitories, minimum quantities of sanitary installations, maximum distances to installations, resting area requirements at construction fronts, among other key issues).

Specifications for labour have been included in Construction Contract. These include provisions not to engage in any child or forced labour, grievance redress process for workers and freedom of association, among other relevant issues.

**Other social measures:** Rural electrification has been a recurrent demand of local populations during consultations – the project will at a minimum provide access to electricity to the settlement along the Deng Deng to Ouami corridor (the route of the transmission line evacuating power from the plant). Furthermore, as a separate component financed by the Promoter, a Local Development Plan has been elaborated. This takes into account, the expectations of the local communities solicited as part of the consultations of additional social support from the project beyond the social mitigation measures in the RAP and ESMP. To this end, the project will finance the design and management of a local development program that will include: (i) a series of outreach and training activities to build local capacity, and (ii) the implementation of micro-projects. Such micro-projects may include: a) provision of basic social infrastructure such as wells, latrines, and classrooms b) basic maintenance and rehabilitation of critical sectors of access roads, b) construction of agricultural storage and drying facilities and livestock enclosures.

## **Public Consultation and Stakeholder Engagement**

Extensive stakeholder engagement has been carried out through out the ESIA process, through formal and informal public consultation meetings, household surveys, and informal unscheduled discussions. Civil society, project-affected people, vulnerable groups, and various stakeholders were consulted on all documents, including the ESMP and the various RAPs. These have been documented in the ESIA and the information used to develop an understanding of the impacts and the mitigation measures. Further stakeholder engagement has also been carried out in the context of the RAP. A summary of the RAP was made available to local communities. Further forward looking stakeholder engagement guidance has been outlined in the ESMP. A formal grievance mechanism has been set up.

## **Other Environmental and Social Aspects**

**Monitoring and Evaluation:** A monitoring and evaluation framework to ensure that the ESMP and RAPs activities are carried out has been outlined in the documentation. With respect to the RAPs, evaluation and monitoring will be carried out to ensure that the overall resettlement objectives are met with respect to livelihood restoration.

## **EIB Carbon Footprint Exercise**

Greenhouse gases will be emitted from the reservoir over the life of the project, mainly through the release of methane resulting from the decomposition of submerged biomass.

Absolute CO<sub>2</sub>e emissions from the project in a standard year of operation will be approximately 258kt. This figure is based on the results of a specific greenhouse gas emissions study undertaken for the project.

The baseline emissions are calculated assuming that electricity generated by the project will displace a mix of grid connected generation, isolated diesel generation and kerosene lamps, and cater for demand growth that otherwise would be met with a mix of new gas-fired and (alternative) hydro capacity. Compared to this baseline, the project is estimated to save approximately 10 kt CO<sub>2</sub>e/yr. By facilitating the development of future run-of-river hydropower capacity at zero emissions, the project will enable more carbon emission savings in the medium to long term.

The loan is expected to cover about 10% of total investment outlays. Pro-rated to this amount, the absolute emissions will be 26 kt CO<sub>2</sub>e/yr and estimated emission savings will be at least 1 kt CO<sub>2</sub>e/yr.