Management of Environmental and Social aspects of large overseas hydropower projects: The Nam Theun 2 case (Lao PDR)

La prise en compte par EDF des aspects environnementaux et sociaux dans les projets hydroélectriques à l'international : l'exemple de Nam Theun 2 (Laos)

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RÉSUMÉ

L'aménagement hydroélectrique de Nam Theun 2 (1080 MW, au Laos) est entré en exploitation commerciale en avril 2010, après 5,5 années de construction, et plus de 10 ans d'études techniques, économiques, environnementales et sociales. Il a été développé et financé par un consortium mené par Electricité de France (EDF). La gestion exhaustive des aspects sociaux et environnementaux a généré une forte attention pour ce projet, depuis ses stades les plus précoces.

Ce papier a pour but de donner une vision des questions Environnementales et Sociales (E&S) associées au projet, ainsi que la manière dont elles ont été gérées. Bien que la gestion de ces questions représente une véritable continuité sur les différentes phases du projet, par souci de clarté elles sont présentées selon ses grandes étapes : (i) études et design, (ii) construction, (iii) mise en service et exploitation.

ABSTRACT

The 1080 MW Nam Theun 2 (Lao PDR) project started operating in March 2010, after 5.5 years of construction and more than 10 years of technical, economical, environmental and social studies. It was jointly developed and financed by a consortium led by Electricité de France (EDF). The comprehensive management of the Environmental and Social aspects has drawn a lot of international attention since its early stages.

This paper intends to give an overview of the Environmental and Social (E&S) issues associated to the project, and the way they've been addressed. Although these issues and their related management represent for most of them a real continuum over the various phases of the project, for clarity purpose the presentation will rely on a description of the relevant activities in each of the three following phases: (i) development, (ii) construction, (iii) commissioning and operation.

MOTS CLES

Environnement, Hydroélectricité, Impacts, Social.

1 THE DEVELOPMENT PHASE

Fig. 1: Location of the NT2 project

The development phase of the current NT2 project took off in the early 2000's. The engineering and E&S studies were carried out a remarkably integrated way, and the final design of the project shows significant features that result from this approach: a regulating pond and a downstream channel to minimize downstream impacts, an aerating weir to improve the downstream water quality, a multi level water intake for the riparian release, irrigation outlets on the downstream channel, ...

During the same preparation phase, extensive social studies were carried out on the impacted communities, on the future inundation area, the construction sites, and the downstream areas. They all relied on a continuous participatory approach, supported by in-depth environmental and socio-economic analysis. Management of environmental aspects of the construction were also carefully examined, and led to production of a comprehensive Environment Management Plan.

One of the original features of the NT2 project is that prior to the Financial Close, all these measures were translated in contractual obligation for the Project in the Concession Agreement. These obligations were previously discussed extensively and agreed upon with the Government of Lao PDR and all lenders (including International Finance Institutions and commercial banks). Strengths and weaknesses of this approach will also be discussed in this paper.

2 THE CONSTRUCTION PHASE

The construction phase started with the Financial Close, in June 2005. This period culminated with the reservoir impoundment in April 2008. During that time, up to 8000 workers were employed on around 300 construction sites, spanning on more than 200km.

2.1 Management of construction

The Environmental Management and Monitoring Plan (EMMP) covering landscaping/revegetation, erosion/sedimentation, cleaning/rehabilitation program, physical/cultural resources management, project Waste and Hazardous Waste Management was done on July 2004. In addition to the EMMP, the environmental issues were managed fully in accordance with the international Standard ISO 14001 (Environmental Management System) for which the Head Contractor has been certified in April 2008 for Nam Theun 2 Project.

A procedure to identify and follow all the legal and other requirements that are applicable to

construction activities (Lao and international) has also been developed. An important training program has been implemented to train all workers on site. Training performed mainly focussed on waste management, water quality wildlife protection, oil and Hazardous Material spillage and storage. For each environmental impacts identified in the EMMP, appropriated mitigation measures have been successfully implemented and relevant indicators records have confirmed the environmental performance of the organization put in place.

2.2 Environmental and social programs

All 15 villages located in the inundation area were resettled prior to the impounding, benefitting from largely improved infrastructure and services. The most difficult part of the resettlement process could therefore start: the livelihood development. Other extensive social and environmentals programs were also implemented at that time: Downstream Program, Health Program, wildlife rescue, endangered species conservation, environmental education, etc...

2.3 Green House Gases and water quality monitoring

EDF, based on its previous experience on similar tropical reservoir, developed a comprehensive research program on Greenhouse Gases (GHG) in order to estimate the net carbon footprint of the reservoir area. Before the first impoundment, this program consisted in a set of baselines (GHG emissions, vegetation mapping and quantification, soil carbon content and in-stream carbon fluxes). After the impoundment a comprehensive monitoring program has been instigated to assess water quality and hydrobiology in the reservoir and in downstream rivers. EDF has set up a local environmental aquatic laboratory, and a 3D process-based model has also been developed.

3 THE COMMERCIAL OPERATION PHASE

The Commercial Operation Phase began in March 2010, but did not mean the end of the E&S activities: hazardous waste had to be properly eliminated, more than 300 sites identified for site cleaning and rehabilitation, etc. A site cleaning and rehabilitation process has been agreed with all parties and a certificate has to be signed for each site. A total number of 300, 000 trees will be planted.

Different waste management practices have been developed to complement the District waste cell operation (collection of recyclables for resale, demonstration worm farms, composting and pig-raising pilot projects, incinerator, etc.).

The Social programs for most of them entered in their second phase, aiming at stabilizing and consolidating the livelihood activities or finalizing the compensations for the actual impacts. End of these programs is scheduled between 2012 and 2014. The project committed in 2005 to fund, for the whole construction and operation phases (31 years) the protection of its watershed, a unique conservation area of 4000 km2, and this ongoing support will continue until 2034.