



# HYDROPOWER FOR SUSTAINABLE DEVELOPMENT 2011

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## PRESS KIT

### Case Study

## Gilgel Gibe Hydroelectric Project – Environmental Management Plan

Ethiopian Electric Power Corporation

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## Introduction

The Gilgel Gibe 1 hydroelectric project was commissioned in 2004 and is currently generating 183MW at its full capacity. The Project is characterized by a large 40m high dam with a storage capacity of 839Mm<sup>3</sup> covering more than 54 km<sup>2</sup> of land at its full supply level. The project has a conveyance system of tunnels and an underground power house consisting of three 61.3MW generating units.

This report is intended to discuss the major environmental and socio-economic impacts encountered during construction, as well as the mitigation measures taken to avert any negative impacts. It also discusses the way the environmental and social issues were handled during construction and the lessons learned, with particular emphasis on the resettlement of project affected people (PAP).

The project Environmental Impact Assessment (EIA) was produced in 1997 by the project Consultant (ENEL/ELC) as part of the revised feasibility study. The purpose of the EIA was to predict the negative environmental impacts that were likely to occur as a result of preparation, construction and operation of the project. As per the project's EIA, an Environmental Monitoring Unit (EMU) was established in 1998 and remained active until the project commissioning period. The Unit was staffed by qualified personnel (an Environmentalist, a Sociologist and a Forester) and was stationed at the project site throughout the construction period.

## Biological Environment

**Flora:** According to the project's EIA, the reservoir area was partly occupied by some 300ha of partially degraded riparian forest. The rest consisted of land used for cultivation, grazing, along with some remnants of the transitional zone and savannah woodland. Therefore, in order to minimize the possible nutrient loads or eutrophication in the reservoir water body, the large woody vegetation was totally cleared from the area prior to inundation. As a compensation measure the project included the creation of a buffer zone of about 4,000ha on the reservoir outskirts, and reforestation activities were undertaken within this buffer zone. So far, about 775,000 trees of various species were planted in the project buffer zone, especially in erosion prone areas. Buffer zone management generally helps to produce a suitable micro-climate to offset the lost woody biomass resources, restore habitat for wild animals, control soil erosion, and minimize sedimentation flow into the reservoir.

**Fauna:** As predicted during EIA, no significant adverse impact on the habitat and populations of fish in the Gilgel Gibe River occurred during the construction phase. The fish species that existed in the river ecosystem have adapted to the lake or reservoir ecosystem (*e.g. Barbus intermedius and Tilapia nilotica*). The habitat losses due to the clearing of riparian forest were compensated for through the creation of the buffer zone. At present species of birds, reptiles and amphibians can be observed in the buffer zone. Some aquatic birds such as white pelicans, cranes, ducks, etc. now come to the area as a result of the reservoir formation.

## Resettlement Activities

The EEPCO, Gilgel Gibe Resettlement Project was established to address the adverse social impacts relating to the construction of Gilgel Gibe Power Plant. One of the roles of Environmental Monitoring Unit was to ensure that the project affected people were properly compensated, resettled and that their livelihoods were restored.

- In total, 706 households (more than 5,000 people) were relocated, of which 144 households were resettled by themselves.
- The project funds were allocated by the Federal Government of Ethiopia. They have been used for compensation of immovable property, construction of dwelling houses, construction of infrastructure, agricultural development activities and the transportation of resettled people.
- The arrival sites were properly surveyed and plots of land with 2.5ha per family were allocated. Resettlers, along with the elders of the community, and administrative bodies were invited to view their plots. They too gave their comments on the position and arrangement of their houses prior to construction.
- All the designs and standards of houses were reviewed and approved by local regional government and the World Bank before construction.
- In total 971 houses were constructed at 9 sites, for 562 households.
- Regarding the infrastructural developments, 3 schools (2 elementary & 1 secondary) were rehabilitated and upgraded, 1 health clinic, 1 veterinary clinic, 1 police station, 3 agricultural development (DA) offices and 1 local administration office were also constructed.
- 4 mosques and 1 church were also constructed at the resettlement sites.
- For potable water supply, 14 hand dug wells were also constructed at the resettlement sites.
- All members of PAPs were provided with general medical checkups, and treatment (where required).
- The resettled households were financially compensated for any immovable property prior to departure to their new resettlement sites.

## Agricultural Activities

- For the first resettlement year, the resettlement project ploughed 2ha of land for each resettled household. The farm land was prepared for crops of *teff* and maize. Improved seeds and chemical fertilizer were also supplied for the first year.
- The Resettlers were closely assisted by the project's agricultural extension workers for the implementation of improved agricultural practices including tree planting, drainage structures, etc.
- The resettlement project was completed two years ahead of impounding and four years ahead of completion of the civil works.

Finally, EEPCO handed over all the aforementioned development work to the local government and administration, after conducting a two-day workshop for key stakeholders on post resettlement monitoring activities.

During the operational period, a post-resettlement evaluation was conducted by an independent consultant to assess whether or not the resettled communities are now better off.

## **Health**

As recommended in the EIA, the Project has carried out a health education campaign in collaboration with Zonal Health Department and the Ethiopian Red Cross Association of the Jimma Zone branch, in order to curb the increasing threat of communicable diseases, in particular HIV/AIDS and other sexually transmitted diseases (STDs).

## **Conclusion**

In January 2001, following a field visit, the parliament of Ethiopia acknowledged the satisfactory completion of the Project. It declared the Project a model for future resettlement in the country. Furthermore, in June 2001, following a field visit of the Gilgel Gibe resettlement, the World Bank's Board acknowledged the project to be the best in East Africa and suggested that it be used as an example of good practice in the region.

As a first experience, EEPCo's commitment to setting up a Resettlement Project and an Environmental Monitoring Unit to successfully deal with the environment, social and health issues in the project area is commendable. With this experience, all of the hydropower projects of EEPCo, which are currently under construction, have established similar environmental units of their own and these are working efficiently.

The efforts made by the Project to avoid and minimize the environmental and social challenges, especially during the construction period, can be taken as a benchmark for future projects.

EEPCo has learned a lot from the Gilgel Gibe Hydroelectric Power Plant. The implementation of an Environmental Management Plan has been found to be supportive of EEPCo's power projects enabling them to strictly follow sound construction guidelines to minimize and/or avoid the predicted, and unforeseen, adverse environmental and social impacts.