

Workshop on Ecological Design of Dams The cases of Diquis and Savegre Hydro Projects

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EXPERIENCE WITH WORLD BANK FINANCED HYDRO PROJECTS

Arenal Hydroelectric Project was the last hydro financed by World Bank in Costa Rica.

No resources allocated for watershed protection

Arun Hydroelectric Project in Nepal was the first case sent to Inspection Panel, not built

"If it is worth to build, its is worth to over-build"

Yacyreta Hydroelectric Project utilizes entire course of Parana River between Argentina and Paraguay, only 14 meters head,

ECOLOGICAL DESIGN ASPECTS OF DIQUIS HYDRO PROJECT

Diquis Hydro is the result of an evolution in design, starting with the much larger Boruca Project which used both tributaries to Terraba.

Intake structure (80 m high) has ports at different heights to be able to control intake water temperature.

Minimum ecological flow of 20 cms after dam.

Restitution channel of 2,5 km to acclimate water temp before discharge.

ICF has invested in all baseline ecological

IMPACT ON LOWER WATERSHED

Sediment load should be reduced due to retention of about half sediments by the dam. Rio Coto Brus is not affected. Sedimentation has been a problem due to deforestation and pineapple plantations in upper watershed.

Change in the hydrograph of Terraba is an inevitable impact. During dry season river has 50 cms and Diquis will add 200 cms, in wet season Terraba has 500-600 cms, Diquis will add 200 cms. Impact in dry season much more significant, can reduce salinity penetration

RISK ASSESSMENT

Due to its size and location, Diquis poses important risks at different levels.

Social: indigenous people consultation mandated by ILO 169. Partnership model.

Financial: ICE's present debt is close to \$3 billion, Diquis would double this amount

Government has required strategic partner.

Climate: change in rainfall patterns unpredictable, climate models lack resolution useful for decision making at project level.

COUNTRY LEVEL STRATEGY

Costa Rica has now close to 90% renewable generation, from hydro, geothermal and wind. Hydro has traditionally been the backbone with close to 70%.

Should Costa Rica continue to build hydro, or focus more on geothermal and wind?

Recent bid for renewables held by ICE showed private wind projects to be most competitive at less than 9 cents per kwh.

Geothermal located in national parks.

CONCLUSIONS AND RECOMMENDATIONS

- 1) Lack of reliable information for public discussion of project.** EIA process needs to be reformed so that baseline studies can be made available to the public.
- 2) Indigenous people consultation critical and must meet UN standards.** Present administration hopes to complete consultation and partnership arrangements by 2014.
- 3) Environmental impact assessment**
Formal study delayed to be completed 2014.

CONCLUSIONS AND RECOMMENDATIONS

- 4) **Management plan for HNTS must be implemented as soon as possible.** The Controller General has issued report that orders implementation of plan. MINAE lacks resources.
- 5) **Need to create consolidated database for protected areas.** As new research and studies come out, all biological information should be organized and stored by INBIO. All information should be open to researchers and the general public.

CONCLUSIONS AND RECOMMENDATIONS

- 6) **Need to articulate strategic alliance among partners;** INOGO showed potential to develop strategic partnerships. In this case the BIOMARCC(project funded by GTZ), universities, foundations like MarViva, Neotropica
- 7) **Need to move from confrontational to symbiotic relationship:** Lower watershed needs to be integrated in design and operation.

Project can help manage the wetland and could