CEPF SMALL GRANT FINAL PROJECT COMPLETION REPORT

I. BASIC DATA

Organization Legal Name: China Institute of Water Resources and Hydropower Research (IWHR)

Project Title (as stated in the grant agreement): ***Impacts of Hydropower Development on Regional Biodiversity in Southwest China***

Implementation Partners for This Project: ***Department of Water Environment, IWHR***

Project Dates (as stated in the grant agreement): September 1, 2006-December 31, 2007

Date of Report (month/year): February 28, 2008

II. OPENING REMARKS

Provide any opening remarks that may assist in the review of this report.

(1) Research specific objectives

(2) Experience and lessons from the outcomes

(3) Suggestions for the future work

III. NARRATIVE QUESTIONS

1. What was the initial objective of this project?

Hydropower project construction in China has been in the ecological control periods. It is necessary for hydropower project construction and management to lessen the side effects on the ecological systems and play a positive role in environmental development. At the regional level, electronic atlas of the relationship between hydropower project and biodiversity is complied. Through the research on the relationship, it can provide some information about the built projects' environmental assessment and the building projects' distribution and design. Here are three specific objectives as following:

(1) National electronic atlas of the Dams position and backwater distribution in Southwest reservoirs based on 90m DEM from USGS(1:250,000)

(2) Electronic atlas of the relationship between hydropower project and biodiversity through the spatial integration of key zonal biodiversity maps in Southeast based on Protecting International Project of China

(3) Quantitative research on the relationship between hydropower and regional biodiversity at macroscopic scale

2. Did the objectives of your project change during implementation? If so, please explain why and how.

The objectives of my project didn't change during implementation.

3. How was your project successful in achieving the expected objectives?

The reasons are listed as following:

(1) Forward research foundation and sufficient dada

At present, the project group is studying on the project of Three Gorge Project's Impacts on eco-hydrological Characteristics in Yangtze Rivers which is supported by National Natural Science Foundation of China. There has been much work done in the pre-time, such as comprehensive literature search on dam impact on ecological environment, data on national dams, 90m DEM from USGS and automated drainage network extraction in watershed based on DEM. Species data about the 314 endangered vertebrates and 213 advanced plant species were compiled from published related literatures by researchers in Beijing University which is our cooperation unit, from which the spatial distributional information can be drawn in order to build expert database endangered species and compile the electronic maps of key factors of biodiversity in Southwest. Therefore, we have self-contained data and done much prophase work.

(2) Feasible research Technology Route

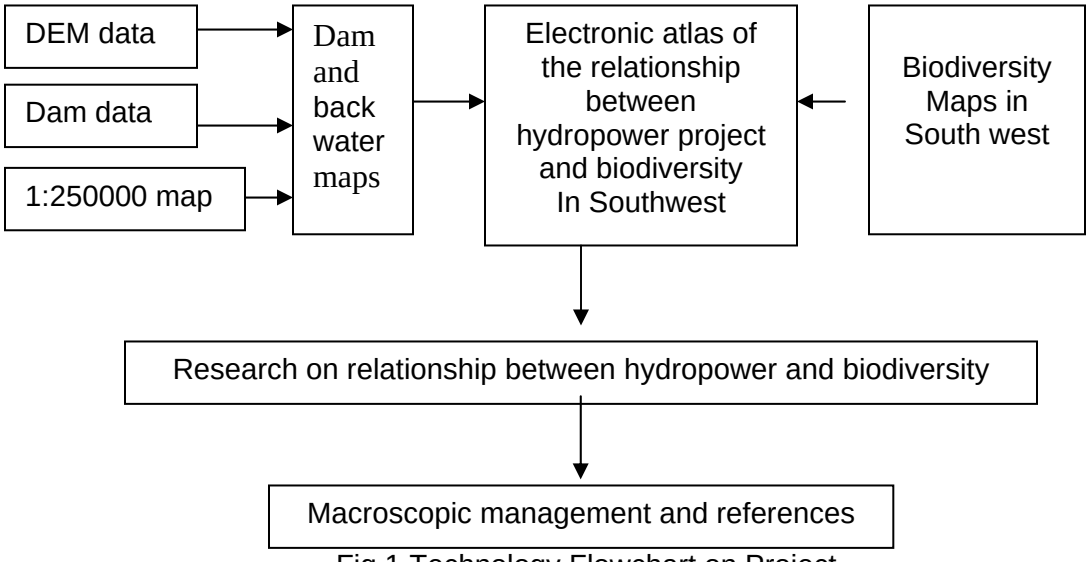

Fig.1 Technology Flowchart on Project

Research region is located in Southwest which is not only national hydropower development base but also one of 25 global biodiversity protecting hot regions. Research object is to overlap dam position and inundating range map in the reservoir and biodiversity key regional map in Southwest to get electronic atlas of the relationship between hydropower and biodiversity in Southwest. Such research methods as spatial analysis, dada integration technology, associated model of GIS and ecology are applied in the research and taken into the different subjects' combination including water science, ecology and spatial geographic technology. From above analysis, we can draw a conclusion that the technology route is feasible focused on research objectives.

(3) Multi-subject cooperation and outstanding research group

Project members specialize in hydrology, environmental hydraulics, environment science and ecology and have sophisticated experiences and technological accumulation in biodiversity, the integration of DEM and GIS. Project group has 7 members and its makeup is sound, among them 4 have advanced technique title, 2 medium technique title and 1 attending graduate student. Meanwhile, the group has sufficient data such as topography, reservoir and biology in Southwest to provide reliable technological foundations to do some validation research.

4. Did your team experience any disappointments or failures during implementation? If so, please explain and comment on how the team addressed these disappointments and/or failures.

When we studied the backwater range in the reservoir of dams, it arose stagnation in the research. Because of USGS DEM come from the images data in 2001, DEM data contain water information in the reservoir if the dam was built and held water before 2001. For the water level at the DEM images was unknown, it is a puzzle in the backwater range based on the dam height and control water levels.

After a long time of exploration and consultation for related experts, slope extracted from DEM in the reservoir is to determine water level of reservoir which is compared with the reservoir image searched from Google Earth and analyze maximal control water level and minimal water level in the reservoir to ascertain backwater range. If not, the median of maximal control water level and minimal water level in the reservoir is used as backwater range.

5. Describe any positive or negative lessons learned from this project that would be useful to share with other organizations interested in implementing a similar project.

Firstly, explicit and finite objective is necessary for such research project and helpful to fulfill the task. If the objective is specific, the members will have a sound understanding and feasible cooperation thus it is easy to achieve.

6. Describe any follow-up activities related to this project.

Based on the project, the team applied the project of ecological zone and evaluation in the upper Yangtze River for SHAN SHUI CENTER FOR NATURE AND SOCIETY. The project is centered on Yangtze Rive above Yibin and based on water resource area and subarea, builds the index system and evaluation methods of the ecological functional division to plot key ecological protection units out.

7. Please provide any additional information to assist CEPF in understanding any other aspects of your completed project.

Liuhui, a college student in China Agriculture University, attended the part work in the project and earned her bachelor's degree in July, 2007.Her thesis is "The impact of hydropower development on biodiversity in the southwest mountain area of China".
Major contents in the thesis are as following:
Southwest mountain area of China possesses abundant hydropower resources, but it is also one of the 34 Key Biodiversity Areas（KBA） in the world. At present, it is the urgent need to address the issue that how to coordinate between regional water resources development and ecological construction. This study integrates the scientific results of both water conservancy and regional biology on the same space information platform, and makes the macro large scale quantitative analysis of the impact of hydropower development on the regional biodiversity in the southwest mountain area of China. The result demonstrates that the proportion of flowing river affected by the backwater of dams is the largest on the Yangtze River, Fujiang River and Yalong Rive. The continuity of the river is the lowest on Fujiang River, Jialing River and Yalong River. If flowing water becomes hydrostatic water，Acipenser sinensis, Myxocyprinus asiaticus, Psephurus gladius, Euchiloglanis davidi are most easily to be threaten, and half of the river in their distribution areas has been affected by dams. At the end of this thesis the next work is put forward.

"Analysis on the dam position methods based on DEM" is published in Environment, Resource and hydraulic engineering in China on Nov. 2007 by Ocean Publishing House (ISBN 978-7-5027-6954-3) firstly supported by the project.

IV. ADDITIONAL FUNDING

Provide details of any additional donors who supported this project and any funding secured for the project as a result of the CEPF grant or success of the project.

Donor	Type of Funding*	Amount	Notes

Additional funding should be reported using the following categories:

- ***A*** *Project co-financing (Other donors contribute to the direct costs of this CEPF project)*
- ***B*** *Complementary funding (Other donors contribute to partner organizations that are working on a project linked with this CEPF project*
- ***C*** *Grantee and Partner leveraging (Other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF project.)*
- ***D*** *Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)*

V. ADDITIONAL COMMENTS AND RECOMMENDATIONS

The project accomplished the anticipated objectives but it is necessary to do further research on the quantitative relationship between dam construction and regional ecology. The contact ratio between dam backwater region and KBA in Southwest is low, from which it can be seen that the division of KBA has considered the human impact and it has no relationship with dam construction. From the estimation of dam's ecological impacts viewpoint, living aquatic species and its distribution affected with inhabitants' change by dam construction is a more worth the whistle project by analysis on the ratio of static reaches to total reaches and the investigation of living aquatic resources in the river.

VI. INFORMATION SHARING

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned and results. One way we do this is by making programmatic project documents available on our Web site, www.cepf.net, and by marketing these in our newsletter and other communications.

These documents are accessed frequently by other CEPF grantees, potential partners, and the wider conservation community.

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