

China: Integrated ecosystem management in Upper Yangtze River Basin (#406)

Description

The Yangtze River is the largest river in China, with a total length of 6,300 km and a drainage area of 1.8 million km². Over 400 million people live in the Yangtze River basin. The river has significant impacts on the environment of the East China Sea. The Government of China is faced to significant costs regarding floods and degradation of ecological conditions in the Yangtze River basin. As a response, the application of Ecosystem Function Conservation Areas (EFCAs) approach has been initiated not only to increase water retention capacity and reduce sediment loads, but also to provide benefits in biodiversity, carbon sequestration, sustainable land management.

Action taken

Efforts have been made to establish two demonstration sites to increase water retention capacity and reduce sediment loads, coordinate sector programs, protect biodiversity, and increase carbon gains in an integrated manner. A system of EFCAs with multiple environmental benefits has been set up in the upper basin of the Yangtze River. In each demo site province, a committee with representation from major stakeholders presided by the provincial government coordinate all the activities in the project. Based on the results of the demonstration activities, the Chinese Government is expected to replicate the project results throughout the Yangtze upper river basin in the future. Monitoring and early warning information system has been established in the 2 demo sites: Baoxing, Sichuan; and Laojunshan, Yunnan.

Lessons learned

The project took the advantage of positive natural and political conditions to speed up the implementation. To sustain the integrated management of the Yangtze River Basin watershed areas and conservation of biodiversity, it is crucial that the MEP mainstream IEM in the implementation of National Biodiversity Strategies and Action Plans (NBSAP).

The project has received the Government of China's high priority. Nature conservation in the upper Yangtze River Basin region has never received as much attention and support as it does today, with planned investment of \$9.29 billion in the next five years. These resources, paying for rehabilitation and restoration measures, will be sector-based and led by the various ministries (Part of these rehabilitation and restoration efforts have established the baseline of investments that this project will build upon to achieve environmental benefits.

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Main Text

The Yangtze River is the largest river in China, with a total length of 6,300 kilometers and a drainage area of 1.8 million km². Over 400 million people live in the Yangtze River basin. Water discharge by the Yangtze River amounts to about 960 billion cubic meters per annum, and has significant impacts on the environment of the East China Sea. In recent years, the river has suffered from industrial pollution, agricultural run-off, siltation, and loss of wetland and lakes, which exacerbates seasonal flooding. As part of its efforts to reduce floods in the Yangtze River basin, the Government of China (GOC) is implementing a series of soil and vegetation conservation programs in the upper Yangtze River basin. In an effort to further increase the benefits of these measures, the GOC has started to implement an Ecosystem Function Conservation Areas (EFCAs) program that will increase water retention capacity and reduce sediment loads. The project also intends to provide benefits in biodiversity, carbon sequestration, sustainable land management and Integrated Ecosystem Management (IEM) in the upper Yangtze River basin. The GOC is interested in participatory IEM as a sustainable mechanism to help reduce poverty and balance the various environmental benefits and costs.

The GOC gave high priority to rehabilitation and conservation of natural ecosystems in the upper and middle basins of the Yangtze River. Nature conservation in this region has never received as much attention and support as it does today, with planned investment of \$9.29 billion in the next five years in the upper Yangtze River basin. These resources, paying for rehabilitation and restoration measures, will be sector-based and led by the various ministries. Part of these rehabilitation and restoration efforts form the baseline of investments that this project will build upon to achieve global environmental benefits. The ecosystem-based approach introduced under the project has been well-received by the policy makers and decisions are made to promote sustainability and replicability of the project results. The project uses the incremental cost approach to help the GOC set up a system of EFCAs with multiple environmental benefits in the upper basin of the Yangtze River. The primary objectives of the project are to complement national efforts to;

- design a system of EFCAs ensuring the protection of global environmental values;
- establish a management-oriented monitoring and early warning system to detect gains and losses of ecosystem functions in EFCAs and protected areas;
- to help establish two demonstration sites showing how EFCAs can actually work and interact with the monitoring and early warning system.

The demonstration sites also act as good example on how to increase water retention capacity and reduce sediment loads, coordinate sector programs, protect biodiversity, and increase carbon gains in an integrated manner. In each province where a demonstration site is located, a committee with representation from major stakeholders presided by the provincial government coordinates all activities in the EFCAs. Based on the results of the demonstration activities, the GOC is keen on replicating the project results throughout the upper Yangtze basin in future.

In addition, assessment of each aspect of ecosystem function in the upper Yangtze River basin and the integrated assessment have been completed. Recommendation for future EFCA plan in the upper Yangtze River has also been provided and this includes technical innovation of an integrated assessment approach. The team working on the project has completed 2010 monitoring in the upper Yangtze River Basin and the two demo-sites. The results have been compared with 2005 baselines leading to monitoring reports of four key ecosystem functions.

Baoxing demo-site was also established an IEM management mechanism at county level and the county's head commissioner is directly in charge of it. Baoxing IEM plan has been developed and adopted. The center of the IEM plan is the idea of ecosystem protection, sustainable use of resources and people's livelihood. Quarry management, ecotourism and alternative livelihood are key points in the IEM plan and ecotourism has become one of the important mainstays of the county though implementing this project. All in all, the project aimed to achieve the assessment of ecosystem functions and Ecosystem Function Conservation Area Plans in the upper Yangtze basin; established ecosystem-function-based Monitoring and Early Warning System (MEWS) in the upper Yangtze basin. It also demonstrated efficiency and effectiveness in achieving global environmental benefits and local environmental and socio-economic benefits by taking an integrated ecosystem management approach in two demonstration sites (Baoxing, Sichuan; and Laojunshan, Yunnan).

Actions taken

A project was established to curb the degradation of critical ecosystem functions in the upper basin of the Yangtze River. The aim is to contribute to the national ecological function conservation area. The strategic goal of the project was to build necessary capacity to assess and plan the location of future EFCAs, design and implement a system to monitor environmental values, and to demonstrate integrated ecosystem management. It aims also to highlight the multiple environmental benefits in EFCAs.

The outcome is the development of alternative livelihoods to promote local economic growth and to increase income of local villagers. Livelihoods such as traditional Chinese herb cultivation and fruit tree plantation have been initiated through this project. With the support of the project, 76 local Tibetan families have started ecotourism business and cultivation of traditional Chinese herbs has been further extended. Laojunshan Demo site also continued with alternative livelihood development, supporting Yangdu mushroom cultivation. Ecotourism in Lashihai area and plantation of *Morchella* spp (a kind of mushroom considered as delicacy in China) are some of the two successful examples of alternative livelihood development in the demo-site.

Training syllabus and materials for 1,000 school children, farmers, authorities and various managers were developed and disseminated among the agencies represented in the IEMCC. IEM and environmental protection training sessions have been introduced in primary schools. More so, maps of main ecological threats and root causes to ecosystem functions in different areas were developed. Coupled with this, assessment of linkages between threat factors and their root causes

to social and socio-economic analyses, assessment of economic value of all ecosystem functions to provide decision-makers with necessary information from an economic perspective. Integrated assessment reports of the ecosystem functions with weighted maps have also been developed. Consequently, ecological monitoring models were updated, and local experts were trained and activities were mainly halted during the except for trainings. The project Established ecosystem-function-based Monitoring and Early Warning System (MEWS) in the upper Yangtze basin.

A database and ecological monitoring models and early warning system in coordination with the two demos were established. Ecological monitoring model and databases in addition to remote sensing-based ecosystem and integrate ecological management indices were all integrated for use in integrated resource. As stated earlier, MEWS information system has been established in the 2 demo sites and it is assisting monitoring work and IEM management in the demo-sites. Chongjiang River Area of the demo-site has been included into the new Laojunshan National Park development plan and approved at Yunnan provincial level.

In Yunnan, Lashihai Nature Reserve staff and local villages have been trained on biodiversity conservation knowledge, and Chongjiang Rivre Area of the demo-site has been included into the new Laojunshan National Park development plan and approved at Yunnan provincial level. In Sichuan, Fengtongzai National Nature Reserve is covered by the Project. A substantive progress has been achieved for Laojunshan demo site in implementation of alternative energy development and compilation of environment education textbook. Alternative energy has also been further developed with more energy-saving stoves and biogas digesters implemented in local villages. Energy development in the demo-site has been given a bigger priority as well and 1488 biogas digesters, 1589 solar energy boilers and 2418 energy-saving stoves were installed for local villagers. The Yunnan EBP has expressed keen interest and support to the Laojunshan demo site, expecting the project outcome to be replicated in other areas in Yunnan. The progress achieved in Laojunshan demo site also received local media interest, contributing to the project visibility propelling issues of conservation among the communities.

A public relations plan to promote the Yangtze project had been formulated and implemented. Assessment of carbon sequestration was completed, as well as the following activities: the threats and root causes for degradation of critical ecosystem functions in the upper basin of the Yangtze River, social economics assessment, and land use assessment of Baoxing county. The out come of this project is a big step forward as MEWS team was able set up platforms for the 2 demo sites, trained local users once, and conducted monitoring work in the 2 demo sites. Laojunshan demonstration site continued with alternative energy development and 100 energy-saving stoves in Liju village of Lijiang were distributed to local community. Baoxing demonstration site developed an IEM plan and established a management mechanism to monitor resources and industries development. Corridors management plan as well as an alternative livelihood plan have been drafted and submitted to the local government for review/discussion. Several training materials have been developed and training courses conducted for the local community.

At national level, two Project Work Group Meetings were convened and in order to monitor and evaluate project progress and to disseminate project results. In terms of project result dissemination, the project organized the 'International Forum on Southwest Yunnan Biodiversity

Conservation'. MEWs information system has been further improved, new functions such as 3D aviation in Lashihai was added and the system has been made more user-friendly. Three training sessions were carried out for local users, one in 2010, the second in June 2011 and the third planned in September 2011. Integrated assessment of ecosystem functions in the upper Yangtze River Basin was completed. Based on results of all the key ecosystem function assessments, recommendations for new EFCA plan in the upper Yangtze River Basin was raised.

The implementation of the project has played a crucial role for full development of institutional mechanism for assessment of ecosystem functions and planning for Ecosystem Function Conservation Areas in the upper Yangtze basin. Other important outcomes of the project include enhancement of remote sensing and field surveys to develop water retention indicators, soil erosion and sedimentation indicators and indicators for measuring habitat quality. The focus is the species distribution and especially those that are endangered or threatened nature to establish biodiversity priority areas have all been enhanced. In summary, the following activities were undertaken as a result of the project; mapping of especially critical biodiversity areas, assessment and mapping of national key program areas and types (e.g., reforestation, farmlands converted to forestlands) wetlands and grasslands). More so, evaluation of carbon sequestration (sink) potential, mapping of energy adjustment programs (e.g., fuel wood-saving kitchens and biogas applications), mapping of information on land use and land use changes to evaluate current productivity of agricultural lands, grasslands, water areas and forest ecosystems. Planting of native trees to improve habitat for wildlife, fruit trees near protected areas and established firewood plantation around villages. Buffer zones were created for Fengtongzhai nature reserve and bamboo corridors between Fengtongzhai and Labahe nature reserves for giant panda as an umbrella species. Development of alternative livelihood package with full participation of all local stakeholders was one of the important things that the project achieved in addition to pilot demonstration of eco-tourism and agro-tourism projects around Fengtongzhai and Jiabin mountains.

Lessons learned

It was noted that the project took the advantage of positive natural and political conditions to speed up the implementation. To sustain the integrated management of the Yangtze River Basin watershed areas and conservation of biodiversity, it is crucial that the MEP mainstream IEM in the implementation of National Biodiversity Strategies and Action Plans (NBSAP).

It demonstrated efficiency and effectiveness in achieving local environmental and socio-economic benefits by taking an integrated ecosystem management approach in the Baoxing demonstration site. Finally, the establishment of an institutional framework for IEM at the Baoxing demonstration site is considered crucial.

The process inevitably requires additional time and efforts from project implementing and executing partners as well as all sub-contractors. If not properly planned, such a complex system could result in disbursement delay that also affects the implementation of planned activities.