China, People's Republic of: Risk Mitigation and Strengthening of Endangered Reservoirs in Shandong Province Project

The Ministry of Water Resources set up the National Reservoir Strengthening Program in 2001, with financial assistance from the government. The first phase of this program was successfully completed, and 1,346 reservoirs are now operating at design capacity. The second phase, involving the rehabilitation of unsafe reservoirs, was completed in 2006-2010. But reservoir rehabilitation will continue beyond the program. Many unsafe reservoirs have been rehabilitated, and class I and II reservoirs, which were not part of the program, are foreseen to deteriorate and need rehabilitation in the future. Reservoirs rehabilitated under the program must be properly operated, maintained, and managed for safety and effective use; otherwise, the rehabilitation would have been futile. To address these issues, sustainable reservoir rehabilitation and management models needed to be established in a province where reservoir safety was a serious issue, and successful models needed to be replicated throughout the PRC. Reservoir safety is of great concern to Shandong Province, among other provinces in the PRC. The Shandong provincial government recognized the urgent need for reservoir rehabilitation as well as the importance of managing the rehabilitated reservoirs properly to be able to use the reservoirs safely and effectively for economic development, but was facing technological and financing difficulties. seeks methodologies and sought methodologies for rehabilitating a huge number of unsafe reservoirs efficiently within a limited budget and for using the rehabilitated reservoirs safely and effectively for economic development. The Shandong provincial government therefore requested a loan from ADB to establish sustainable reservoir rehabilitation and management models, through the rehabilitation, management, monitoring, and evaluation of model reservoirs.
Two model reservoirs were withdrawn from the project. Rehabilitation of the seven model reservoirs has been almost completed. The threat of reservoir failure has been reduced and the threat of flood damage has been mitigated for the areas downstream of the reservoirs. Irrigation area was increased from 27,300 ha in 2009 to 35,263 ha in 2014, in the areas downstream of the nine model reservoirs. Models established under the project are (i) reservoir rehabilitation technical guidelines, (ii) a manual for dam failure modeling methodologies for risk estimation of dam failure, (iii) a manual for risk-based methodology for reservoir rehabilitation planning, (iv) a framework and a manual for a provincial reservoir portfolio database, (v) a report on proposed management measures, and (vi) manuals for practical reservoir safety management. These models are being used by SPWRD, administration offices of model reservoirs, provincial design institute, and/or local design institutes in the project area. Models will be disseminated to other local governments including water resources bureaus, reservoir administration offices, and local design institutes, as necessary.

Under the piggybacked technical assistance, plans were formulated for a model river basin for (i) integrated water use, (ii) integrated flood management, and (iii) greater environmental benefits downstream, being guided by the principles of integrated water resources management.

**Implementation Progress**

**Description of Project Outputs**
Rehabilitation of model reservoirs
Establishment of sustainable reservoir rehabilitation and management models

**Project management support**

**Status of Implementation Progress**
Two model reservoirs were withdrawn from the project. Rehabilitation of the seven model reservoirs has been almost completed.
Established and being disseminated.
Provided.
Training completed.

**Geographical Location**
Huacun Reservoir, Laiyang Shi, Linqu Xian, Longwaitou, Muuyu Shuiku, Pingyi Xian, Qiangkuang Shuiku, Qingzhou Shi, Renhe, Shizui, Songshan Shuiku

**Safeguard Categories**

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<th>Environment</th>
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<tbody>
<tr>
<td>Involuntary Resettlement</td>
<td>B</td>
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<tr>
<td>Indigenous Peoples</td>
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**Summary of Environmental and Social Aspects**

**Environmental Aspects**
The project was in environmental category B, according to ADB’s Safeguard Policy Statement. An environmental assessment of the project conforming to the PRC regulatory framework and ADB’s Environmental Assessment Guidelines (2003) was carried out. The initial environmental examination report summarized the findings of the environmental assessment reports on the nine subprojects and the due diligence review of the associated facilities. Extensive public consultations involving stakeholder and focus group discussions were undertaken twice during project preparation. The potential adverse impact during rehabilitation and operation included the limited standard impact of construction and the unsafe disposal of dredged sediments, construction spoil, wastewater, and solid waste. This impact prevented or minimized to acceptable levels through the implementation of an environmental management plan with adequate mitigation and monitoring arrangements.

**Involuntary Resettlement**

**Evaluate**

6 of the 7 subprojects required land acquisition or household relocation, but the impact was not significant. The project was in category B for involuntary resettlement, according to ADB’s Safeguard Policy Statement (2009). In total, 20.2 ha of collectively owned land, 89% of which is cultivated farmland, was estimated to be affected permanently. Four of the nine subprojects was expected to require the demolition of 1,056 square meters of housing and the relocation of six households with a total of 27 persons. Some productive assets, ground attachments, basic infrastructure, and special facilities were also expected to be affected. The implementing agencies, with the assistance of the consultants hired under the project preparatory TA, prepared eight resettlement plans and one due diligence report, for nine subprojects including two subprojects which withdrew from the project. The pre-examination of land use was domestically approved for all subprojects. The local governments endorsed the plans and disclosed the relevant information to affected persons. The key issue for the social safeguards ensured that the local governments would fulfill their commitment to provide investment financing for development projects in the communities that were affected by the construction of the dams in 1960-1980. Land acquisition and resettlement costs were fully financed by the implementing agencies.

**Indigenous Peoples**
There are no indigenous peoples within the project locations; the project was therefore in category C in this regard.

**Stakeholder Communication, Participation, and Consultation**

**During Project Design**
The design of the project was carried out by design institutes, which engaged in extensive consultations with stakeholders, beneficiaries, and project-affected people. A participatory and consultative methodology was adopted for the social and poverty analysis during project preparation. It involved (i) group discussions with villagers in different economic conditions in 13 villages in the seven project counties; (ii) interviews with chiefs and accountants of 13 villages in seven project counties; (iii) interviews with directors and officials of key agencies in seven project counties, including poverty alleviation offices, civil affairs commissions, urban construction bureaus, agricultural bureaus, statistical bureaus, and women’s federations; (iv) interviews with directors and officials of the provincial water resources department and the water resources bureaus of seven project counties; and (v) interviews with directors and officials of nine reservoir administration offices.

**During Project Implementation**
The C&P plan was prepared and used before and during project implementation, monitoring, and evaluation. Consultations, including a grievance mechanism described in the resettlement plans, continued during land acquisition and resettlement, and the problems of affected persons were properly addressed before project implementation. In addition, for those subprojects with irrigation improvement components, provincial and local government agencies consulted with relevant towns and villages in the PIAs on the general layout of irrigation works and possible tariff changes. For those subprojects with both household and industrial water supply functions, consultations and public hearings were held if any tariff changes were proposed after the subprojects are completed. To assess changes in the social and economic conditions of the project area resulting from the project, monitoring and evaluation using participatory methodologies and techniques will be conducted.

**Business Opportunities**

**Consulting Services**
The project will require consulting services for (i) the establishment of a sustainable reservoir rehabilitation and management model; and (ii) project management support. These consulting services will be financed by the ADB loan and the consultants will be recruited by the PPMO according to ADB’s Guidelines on the Use of Consultants. The establishment of a sustainable reservoir rehabilitation and management model will require a total of 19.5 person-months (pm) of international consulting services and 73.0 pm of national consulting services which will be provided by a team of consultants engaged through a firm. The consulting firm will be selected by (i) inviting simplified technical proposals; and (ii) using the quality- and cost-based selection method, with a quality cost weighting ratio of 80:20. The project management support will require a total of 12.0 pm of national consulting services. The consultants will be engaged based on individual selection method, since (i) the number of the national consultants is only three; and (ii) the project management support will be provided independently by the three national consultants and the assignments are straightforward. In addition to these consultants, ADB will recruit other consultants for an associated TA, the LPMOs will engage national consultants for engineering and construction supervision and quality inspection using counterpart funds, and the PPMO will also engage an independent agency acceptable to ADB for external resettlement monitoring and evaluation using counterpart funds.
All procurement of goods and works will be carried out in accordance with ADB’s Procurement Guidelines (2010, as amended from time to time). Contracts for goods estimated to cost $1.0 million and above and contracts for works estimated to cost $10.0 million and above shall be procured using international competitive bidding (ICB) procedures. Contracts for goods estimated to cost less than the above ICB value but equal to $100,000 and above will be procured through national competitive bidding (NCB) procedures. NCB will be conducted in accordance with the PRC Tendering and Bidding Law (1999), subject to modifications agreed with ADB. Contracts for goods and works estimated to cost less than the above NCB values will be procured using shopping procedures. The relevant sections of ADB's Anticorruption Policy (1998, as amended from time to time) will be included in all procurement documents and contracts. Before the start of any procurement, ADB and the government will review the public procurement laws of the central and state governments to ensure consistency with ADB’s Procurement Guidelines.

An assessment of the procurement capacity of the executing and implementing agencies has confirmed that these agencies, acting through a procurement agency and with the assistance of ADB and the consultants, would capably conduct procurement, including advance contracting, meeting ADB’s requirements. A procurement agency that is familiar with ADB’s procurement procedures was hired by the SPG in March 2010 to procure all works and goods under the project on behalf of the executing and implementing agencies.

### Loan 2700-PRC

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