

Environmental Assessment Report

Summary Initial Environmental Examination
Project Number: 39321
May 2008

PRC: Proposed Loan and Global Environment Facility Grant for Shaanxi Qinling Biodiversity Conservation and Demonstration Project

Prepared by Shaanxi Provincial Government for the Asian Development Bank (ADB).

The summary initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

1. The Project is classified as environment safeguard category B. This summary initial environmental examination (SIEE) was prepared based on the Qinling National Botanical Garden (QNBG) Environmental Impact Assessment (EIA) Report¹ prepared in accordance with the People's Republic of China's (PRC) regulations. These reports comply with Asian Development Bank requirements for category B projects.

A. Project Description

2. The project area (PA) is located on the northern slope of the Qinling Mountains (QM), about 45 kilometers (km) from Xian, comprising an area of 458 square kilometers (km²) with about 20,400 people. The QM is an internationally-important biodiversity hotspot and represents some 70% of the PRC's biodiversity including an estimated 300 Giant Panda. QM is central to soil and water management linked to both the Yangtze and Yellow rivers. The Project will improve biodiversity conservation and management by restoring forest habitat, improving endangered species management, and providing sustainable livelihoods for the population of the PA, and demonstrating the benefits to the rest of QM and other similar areas in the PRC. The Project will provide significant environmental, economic, and social benefits throughout the PA. The Project will address underlying causes and effects of both historical and contemporary resource degradation.

3. The Project will consist of three primary outputs: (i) participatory biodiversity management for the Qinling Biological Conservation and Demonstration Area (QBCDA), (ii) enhancing biodiversity conservation through eco-tourism development in the plains area, and (iii) project management. Using sustainable financing mechanisms for biodiversity conservation, the habitat of the protected area, QBCDA, will be improved over time to promote mixed forest coverage and flora and fauna species expansion. The small population that live in scattered settlements in QBCDA will be encouraged to support biodiversity conservation objectives and stop unsustainable farming and other activities.

4. **Plains Area.** This area consists of a 2-km wide strip of predominantly flat land along the north side of the QM that is developed for eco-tourism, agricultural/horticultural, and residential purposes. The population is approximately 15,800 persons. The Project will support the following:

- (i) **QNBG.** The activities proposed under this subcomponent include building 18 specialized gardens and other infrastructure, covering an area of about 269 hectares (ha), one greenhouse of 600 square meters, two main exhibition halls, research facilities and infrastructures including irrigation system, drinking water supply, wastewater treatment, solid waste management, roads, and cableway. This component also includes restoration of 18 Daoist religious buildings and temples. Annual visitation for both the gardens and Shaanxi Animal Rescue Center (SARC) is projected to be 800,000 by 2013.
- (ii) **SARC.** The proposed SARC development will expand from 141 ha (current operation) to 971 ha (proposed operation). The expanded SARC is being designed to promote animal welfare and captive breeding of at-risk species.

¹ The Shaanxi Qinling Botanical Garden and the Shaanxi Animal Rescue Center completed by Xian University of Architecture and Technology, May 2007.

These functions are linked to eco-tourism development and to adopt new innovative approaches for rescuing, protecting, and improving the living conditions of endangered and rare wild animals. The proposed activities include (i) building an animal hospital, a rescue and emergency department, a zoology research lab, and a dormitory for experts; (ii) breeding and raising bases for Giant Panda, Crested Ibis, and Golden Monkey, and other artiodactyls, as well as forage bases for the above animals; (iii) establishing animal protection and exhibition facilities; and (iv) constructing infrastructure including internal roads and paths, and a wastewater treatment plant.

5. **QBCDA.** QBCDA consists of steep land with a dispersed population of about 4,600 persons over an area of about 400 km². The area was previously managed by the Louguantai Forest Farm with large areas heavily logged. Remoter areas retain high biodiversity values. The Project will support habitat rehabilitation for biodiversity conservation. There are a number of isolated communities in QBCDA practicing unsustainable agriculture on steep slopes that will be assisted to develop more sustainable livelihoods and adopt more appropriate land-use practices. The long-term vision for QBCDA is to develop and enhance the ecological sustainability of natural resources and ecosystems to enhance biodiversity. Models developed in the management of QBCDA will be extended with financing to nature reserves in QM.

B. Description of the Environment

6. Over 90% of QM has been degraded through inappropriate farming, logging, overuse of natural resources, destructive mining operations, and pollution from solid waste and agrochemicals over many decades. As a result, the water resource quality is in serious decline. There are two major rivers in the PA, the Tianyu and Jiuyu rivers. The water quality of Tianyu river meets the Class I water standard—water from natural sources, except coliform bacteria, which is associated with the discharge of human and animal waste. Groundwater from Dianzhen village adjacent the site of the botanical garden meets Class III standard of quality standard for groundwater, except ammonia and coliform. The high ammonia may be associated with the agricultural activities.

7. QM is biologically rich, with many endangered rare or endemic plant and animal species including the Giant Panda, Golden Takin, Golden Snub-nosed Monkey, and Crested Ibis (the national bird of Japan). The mountains are characterized by very high levels of endemic biodiversity found in temperate and sub-tropical ecosystems, as well as a vertical spectrum of vegetation types; 70% of all vegetation types in the PRC are represented. In the PA, six species are globally threatened including four amphibians and two reptiles. Two species of fish are vulnerable, one of which is protected in Shaanxi, the other is listed in the national red data book as class II. Noted species in the Tianyu River of concern include the Manchurian Trout, the Giant Salamander, and the Soft-shelled Tortoise. The PA is included in the Qinling Mountains Ecosystem Function Conservation Area (QMEFCA) within the high priority Central Conservation Zone of Qinling Water Resources and Biodiversity Function Zone. The proposed activities in this Project are consistent with the requirements of the QMEFCA. Under the proposed QMEFCA framework, the “Shaanxi Qinling Mountains Northern Slope Ecological Environment Protection Plan” was prepared and approved by the Shanxi Environmental Protection Bureau in March 2007. The Project conforms to the development standards stated in the Northern Slope Protection Plan. The population of the PA has living standards well below provincial averages.

C. Environmental Impact and Mitigation Measures

8. **QNBG.** Potential adverse impacts associated with the QNBG include (i) impacts due to road and cableway construction; (ii) possible invasion by exotic species; (iii) impacts on local water resources from water supply extraction; (iv) waste water and solid waste impacts; and (v) impacts to landscape, culture, and religion. A total of 33.5 km roads will be improved (including about 13 km of existing roads in the plains area and 17.5 km of the existing road in QBCDA) and a cableway will be constructed for QNBG. Potential adverse impacts from road and other construction activities are: (i) impacts to soil, (ii) impacts to water resources, and (iii) impacts to air quality. Potential impacts to the soil by road construction are from (i) soil erosion, and (ii) soil contamination. Mitigation measures against soil erosion during construction will include appropriate engineering design (batter slopes, compaction levels, installation of culverts, etc), planting of vegetation, construction of appropriate stormwater drainage, and limiting off-corridor vehicle movements. Mitigation against loss of agricultural land includes (i) where possible, construction camps and material storage areas will not be located on agricultural land and pre-existing hardstand storage areas will be used, (ii) where this is not possible, agricultural land will be rehabilitated after completion of construction and removal of the construction camps and material storage areas, and (iii) construction traffic will be confined to the existing road corridor. Mitigation measures against soil contamination will include (i) appropriate storage of hazardous materials (including hydrocarbons) and hazardous/non-hazardous wastes, (ii) an oil interceptor will be provided for all vehicle wash-down activities, and (iii) all hazardous wastes and non-hazardous wastes will be disposed at local municipal waste disposal facilities, there will be no site-specific landfills developed for the Project. Potential impact to water resources along the alignment includes (i) hydrocarbon leakage, and (ii) sewage discharge from construction camps. Sanitary wastewater from the construction camps will be collected and disposed to nearby municipal treatment facilities. Sanitary wastewater will not be disposed untreated to adjacent waterways. Hydrocarbon leakage will be mitigated through appropriate storage and handling of hydrocarbon in work camps including secondary containment and provision of spills cleanup equipment.

9. The specialized gardens will involve over 1,000 species of plants. There is a threat of exotic species invading QBCDA. QNBG will develop and implement an environmental risk assessment for bio-safety as part of the detailed design. The water supplies for QNBG are from two sources. About 1,405 tons per day (t/d) of surface water will be taken from the Tianyu river (less than 1% of total flow) for the irrigation system (west part). Groundwater, about 252 t/d, will be extracted from a well near the Tianyu river. Given the relative sufficient precipitation and surface water recharge in the area, the demand is not a significant volume and potential impacts can be minimized by site selection, water saving, and a monitoring program. It is estimated that about 201 tons of wastewater and 1.51 tons of solid wastes will be produced daily. Secondary sewage treatment will be constructed to treat sewage up to the national irrigation standard and discharge will be used for grey water irrigation purposes. Solid waste will be collected and sorted for recycling on-site, and trucked to the municipal solid waste treatment facility. Reconstruction of the eight historical culture sites ranging in size from 200–3,600 square meters will add to local cultural values. The design and style of these reconstructions will be consulted with the public and religious groups to ensure the building designs are acceptable.

10. **SARC.** Potential impacts will include (i) soil erosion, (ii) source water protection, (iii) loss of vegetation, (iv) water pollution, and (v) waste disposal. Eighty-five percent of the expanded area will be used for forage bases to plant bamboo and other suitable plants and fruits for the animals. This operation will be favorable for water and soil conservation. However, there are 64 ha of land that will be converted into animal breeding and raising. Development of infrastructure

facilities in these bases may create soil erosion during construction. The soil erosion will be effectively controlled by sound planning, good engineering, and integrated management. Water pollution associated with SARC would mainly occur in the main area and the satellite centers. A secondary wastewater treatment facility with a capacity of 300t/d is designed for treating wastewater generated by animals and visitors. The sewage generated in the satellite centers is relatively small and scattered and is currently sold to local farmers. The treated effluent will be used for irrigation and no direct discharge to the surface water will take place. Solid waste management and the potential impacts from road construction will be managed in the similar way as proposed for QNBG.

11. **QBCDA.** QBCDA will be managed for the primary purpose of biodiversity conservation. The long-term vision for QBCDA is to develop and enhance the ecological sustainability of natural resources and ecosystems to enable biodiversity to be enhanced, managed, and secured. The long-term status of QBCDA involves improved coverage and quality of forest to increase the habitat for QM biodiversity. The reforestation and silviculture development proposed while on a large scale is not expected to have any negative effects and will be managed through the preparation of a habitat and forest management plan for QBCDA. Any small business development including home-stay tourism and forest-product processing will be screened by the Project Management Office (PMO) and QNBG.

12. The provision of social infrastructure is linked to water and solar energy, and eco-tourism activities. These will be mitigated by the following environmental considerations (i) design should be consistent with the landscape and will include sustainable practices to reduce environmental impact; (ii) low energy consumption technologies for lighting will be utilized; (iii) solid waste – convert biodegradable waste to compost that can be used on site. Non-biodegradable waste would be collected and removed for disposal in the municipal landfill or recycled; (iv) water supply – it is expected that the water supply will be from a local spring source (quality tested); (v) sewage and wastewater – septic tanks combining with on site small biological treatment will be applied; (vi) walking trails – existing footpaths will be used; low numbers of users will require no upgrading or surfacing of paths; and (vii) the ecology, home stay, and other micro-scale resource-based tourism activities will be managed under an environmental monitoring plan.

13. Some road and mountain pathway improvement will also be conducted including the canyon road (17.5 km) and mountain paths (109 km). Potential adverse impacts are: (i) uncontrolled vehicles and visitors; (ii) construction requiring earthworks; (iii) possible blockage of wildlife movement; (iv) impacts during construction (wildlife disturbance and temporary or permanent displacement); (v) river bank erosion by increased traffic, unintentional wildlife, and habitat disturbance; and (vi) other construction associated impact. Mitigation measures will include (i) careful site (alignment) design to avoid encroachment into the sensitive wildlife area, (ii) controlled attendance numbers at the QNBG entrance and implementation of an access management plan, (iii) no construction between dusk and dawn or avoiding excessive noise, and (iv) replanting and afforestation along the road and river banks to minimize soil erosion and protect habitat. Construction mitigation measures for the roads component will be the same as described for the QNBG.

D. Institutional Requirements and Environmental Management Plan

14. **Institutional Requirements.** The Shaanxi Provincial Government will be the executing agency for the Project and will have overall responsibility for ensuring that all environmental standards and procedures are followed. Under the supervision of Provincial Development and

Reform Commission (PDRC), the implementing agency, QNBG, will be responsible for the implementation of all corresponding environmental mitigation measures and to monitor programs recommended in its EIA and this SIEE. Prior to project construction, QNBG will form an environmental management unit (EMU) for environmental management and operation including environmental supervision of contractors. The EMU will ensure implementation of the environmental management plan and environmental monitoring plan during construction and operation of the Project. The construction contractor will designate an environmental representative, who will be responsible for the environmental management of construction activities during project construction.

15. **Environmental Management and Monitoring Plan.** The summary environmental management plan (EMP), included in this SIEE, is based on the full EMP included in the EIA reports. The PMO will translate the SIEE, including the summary EMP, into Chinese. PDRC/PMO will ensure that the SIEE (including summary EMP) and the full EMP in the corresponding EIA are included in all contractors bidding documents and operating contracts. The EMU will be responsible for implementing the EMP during project construction and operation. The EMU will ensure that the EMP is updated periodically during construction. The Project will utilize appropriately qualified environmental monitoring service providers for conducting the environmental monitoring duties specified in this SIEE. The environmental monitoring agency will conduct the monitoring program and submit monitoring reports to (i) PDRC/PMO, (ii) Shaanxi Environmental Protection Bureau, (iii) QNBG, and (iv) Asian Development Bank twice annually during construction.

E. Public Consultation and Information Disclosure

16. Public consultation consisted of (i) issuing questionnaire surveys to affected persons, and (ii) holding workshops with relevant stakeholders. Two public consultative surveys were conducted during the project preparation, consisting of (i) 24 valid respondents from 30 questionnaires in October 2002 during preparation of the EIA, and (ii) 97 valid respondents from 101 questionnaires in December 2006 during the supplementary EIA study. The surveys are considered to have sufficient representatives in the PA. Two workshops were held on 15–16 December 2006, respectively, with a panel of 47 participants including province and local government representatives. Leaders of the townships and villages in the vicinity of the PA, academy, and nongovernment organization representatives, such as the Xian Office of the World Wildlife Fund, were fully involved in the workshops. Information regarding the Project was also disseminated to the public through media and QNBG's website. The public participation has played a very important role in the EIA and project design. For example, the width of the road from Jinniuping to Caihulu via Shouyangshan has been reduced from 6 meters to 1.5 meters with a saving of about \$1.7 million. These adjustments will not only save the project cost, but reduce the potential environmental impact on the fragile ecosystem in the PA and contribute to a sustainable and cost-effective investment.

F. Conclusions

17. The analysis undertaken in this SIEE indicates that the majority of the project's impacts are environmentally beneficial and will have a large and positive impact on securing long-term biodiversity conservation and sustainability in QM. Some minor adverse impacts are associated with the Project, mainly related to construction activities. All of these can be mitigated by appropriate measures. Therefore it is concluded that no further EIA is required.