Validation Report

Reference Number: PVR-384
Project Number: 37596
Loan Number: 2239
January 2015

People’s Republic of China: Guangxi Nanning Urban Environmental Upgrading Project

Independent Evaluation Department
Asian Development Bank
ABBREVIATIONS

ADB  –  Asian Development Bank
FIRR – financial internal rate of return
m²  –  square meter
MDG – Millennium Development Goal
NMG – Nanning Municipal Government
PCR – project completion report
PMO – project management office
PRC – People’s Republic of China
RRP – report and recommendation of the President
SWM – solid waste management

NOTE

In this report, “$” refers to US dollars.

Key Words
asian development bank, environmental management, flood control, people’s republic of china, PRC, public satisfaction and health, reforestation, solid waste management, urban environmental upgrade, water quality

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PROJECT BASIC DATA

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ADB = Asian Development Bank; ADF = Asian Development Fund; IED1 = Independent Evaluation Department, Division 1; NMG = Nanning Municipal Government; OCR = ordinary capital resources; OJT = on-the-job trainee; PCR = project completion report.

I. PROJECT DESCRIPTION

A. Rationale

1. During the last 2 decades, rapid economic growth in the Guangxi Zhuang Autonomous Region gave rise to a high demand on basic urban infrastructure services. Inadequate sanitary services affected the region, degrading the urban environment, deteriorating the quality of life of urban residents, and making economic development inefficient. The water pollution level was worse than class V of the national quality standard.\(^1\) In 2004, the incidence of waterborne diseases, such as dysentery, was 46.26 per 100,000 persons; and of vector-borne diseases, such as diarrhea, was 52.37 per 100,000 persons.\(^2\) Upgrading the environment was the government’s main priority, which was reflected in its development strategy. The People’s

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\(^1\) The environmental standards of the People’s Republic of China (PRC) had five classes for surface water quality. Class I was the best, class V was the worst.

Republic of China (PRC) had enacted several environmental laws on the prevention or control of pollution of air and water.\(^3\)

2. The government had requested the Asian Development Bank (ADB) to help improve the urban environment in Nanning City, capital of the Guangxi Zhuang Autonomous Region, by reducing flood risks, improving wastewater and solid waste management, and expanding the green environment. The project was consistent with ADB’s water policy\(^4\) and was expected to help the PRC achieve the Millennium Development Goals (MDGs) for environmental sustainability and increased access to safe drinking water and basic sanitation. The project had four subprojects: (i) Xinxujiang River environmental upgrading, (ii) Kelijiang River environmental upgrading, (iii) solid waste management, and (iv) Qingxiushan Park ecological upgrading. A loan of $100 million from ADB’s ordinary capital resources was approved for the project on 26 June 2006, and became effective on 10 January 2007.

B. Expected Impact

3. The expected impact, as indicated in the design and monitoring framework at appraisal and at completion, was enhanced urban environment and public health in Nanning City through (i) improved flood control, (ii) improved solid waste and wastewater management, and (iii) expanded green environment. The performance targets were: (i) increased public satisfaction with the urban environment, (ii) increased number of visitors to Qingxiushan Park from 1.3 million in 2004 to 2.0 million in 2010; and (iii) reduced incidence of dysentery and diarrhea by 10% from the 2004 levels of 46.26 and 52.37 per 100,000 persons, respectively.

C. Objectives or Expected Outcome

4. The project aimed to improve urban environmental management by 2010 by achieving the following targets: (i) reduced flood risk to no more than 5% annual probability in the Xinxujiang and Kelijiang rivers within the Xiangsihu New District; (ii) upgraded water quality from worse than class V to class IV in the Xinxujiang River and to class III in the Kelijiang River; (iii) improved efficiency of solid waste transportation by 50%; (iv) reduced solid waste and general dirt in city streets; (v) expanded green space by 0.5 square meters (m\(^2\)) per capita per annum; and (vi) increased public awareness of environmental protection. The project completion report (PCR)\(^5\) noted that the project outcomes and impacts envisioned at appraisal remained unchanged at completion despite the change in scope.

D. Outputs

5. The project had four components: (i) Xinxujiang River environmental upgrading, which includes the construction of flood control facilities, wastewater collection facilities, lake dredging and flushing, and public amenity along the Xinxujiang River; (ii) Kelijiang River environmental upgrading, which includes the construction of flood control facilities, wastewater collection, lake dredging, and public amenity along Kelijiang River; (iii) solid waste management, which includes the construction of domestic solid-waste-transfer facilities and provision of street-sweeping vehicles; and (iv) Qingxiushan Park ecological upgrading, which includes forest expansion and improvement and construction of wastewater collection facilities.

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at Qingxiushang Park. Institutional capacity building and environmental management of Nanning City was also undertaken through the environmental upgrade of rivers, improvement of solid waste services, and reforestation. Almost all target outputs have been fully or largely achieved. Three planned works did not receive loan financing but were financed with domestic funds: (i) construction of the pumping station and delivery main for the transfer of water from Yongjiang River to flush through Xinxujiang Lake during the dry season; (ii) construction of storm water drainage pipe network to serve the proposed Xiangsihu New District (23.2 square kilometers); and (iii) construction of two separate sewer routes to transfer wastewater from Qingxiushang Park to the Longdong wastewater treatment plant.

6. The PCR noted that the project’s broad outputs were maintained despite the change in project scope to reflect adjustments to the construction site locations (alignment in sewerage pipeline and riverbanks) and other changes in engineering design. These occurred primarily in response to the adoption of the new urban master plan for 2004–2020 and the Water City concept for Nanning.

E. Provision of Inputs

7. The project cost at appraisal was estimated at $262.7 million, which included $100 million (38.1% of total cost) to be financed by ADB. The remaining 61.9% was to be provided by the NMG and loans from domestic banks. The actual project cost was $359.1 million, $96.4 million or 36.7% more than the appraisal estimate, with the NMG covering the additional cost. The increased cost was mainly due to the appreciation of the yuan, cost overruns for resettlement, and design changes. The main cost overruns because of a change in scope were recorded in civil works at $111.9 million, against the appraisal estimate of $96.7 million. Because compensation standards were increased in response to the real estate boom in the PRC, resettlement amounted to $156.1 million against an estimate of $86.3 million. The substantial decline in the London interbank offered rate since 2008 resulted in savings from actual interest charges, which were estimated to be about $8.5 million.

8. At completion, ADB disbursed $96.2 million out of the $100 million planned. Disbursement was initially slow because of design changes and resettlement issues, but gradually accelerated as more contracts were awarded during implementation. Although the loan was approved on 26 June 2006, it had taken half a year to become effective in January 2007. The expected closing date of June 2011 was extended by 2 years because of adjustments made (para. 6), and was physically completed in April 2013 and financially closed in June 2013.

F. Implementation Arrangements

9. The NMG was the executing agency. The implementing agencies were the Nanning Investment and Development Company for the Xinxujiang River environmental upgrading subproject, the Nanning Xiangsihu Investment Construction and Development Company for the Kelijiang River environmental upgrading subproject, the Nanning Shixi Solid Waste Treatment Company for the solid waste management (SWM) subproject, and the Nanning Qingxiu Mountain Scenic and Tourist Resort Development Company for the Qingxiushan Park ecological upgrading subproject. The project management office (PMO) established within the NMG financial bureau served as secretariat of the project steering committee, which was headed by the vice mayor, and was responsible for interagency coordination, including cooperation with ADB and monitoring of implementation progress. No technical assistance was associated with the project.
II. EVALUATION OF PERFORMANCE AND RATINGS

A. Relevance of Design and Formulation

10. The PCR rated the project *highly relevant* both at appraisal and at completion. The objective to enhance the urban environment and public health in Nanning City was relevant to the government’s development strategy\(^6\) and ADB’s country strategy and program;\(^7\) it was consistent with the PRC’s Eleventh Five-Year Plan and Twelfth Five-Year Plan\(^8\) and Nanning City’s master plan for 1995–2010 and 2004–2020. However, this validation notes that changes in project activities and their locations/alignment including technical designs caused challenges and delayed implementation—as a result of changes in the Nanning City master plan and adoption of the Water City concept. The project experience illustrates the issues faced by ADB and the government in implementing projects that have an evolving strategic basis. These issues should be recognized at appraisal as risks to design, with greater flexibility built into the project design or financing modality. The modified project scope increased costs and the time required for resettlement. This validation recognizes the adjustments ADB made so that project activities remain consistent with the evolving city master plan. Given the issue of the project’s strategic basis—at the municipal master plan level—this validation rates the project *relevant*.

B. Effectiveness in Achieving Project Outcome and Outputs

11. The PCR rated the project *effective* in achieving its expected outcome of improved management of Nanning’s urban environment (also an MDG 7, Target 10), mainly because the six outcome indicators were achieved. While the PCR did not discuss this in detail, this validation agrees that majority of the outcomes have been achieved, except for the indicator on water quality. The project was expected to improve the Xinxiujiang River’s water quality from worse than class V to class IV, and upgrade the Kelijiang River’s water quality to class III. This was only partly achieved as the Xinxiujiang River’s water quality improved only to class V and the Kelijiang River’s water quality to class IV by project closing. Nevertheless, the project was able to meet the other five outcome indicators: (i) probability of seasonal flooding in the Xinxiujiang and Kelijiang rivers within Xiangsihu New District reduced to less than 5%; (ii) solid waste transportation efficiency improved by 50% through the use of compression facilities; (iii) areas of the city to be cleaned and street-sweeping capacity increased; (iv) green space expanded to 10.9 m\(^2\) per capita from 7.4 m\(^2\) in 2005; and (v) public awareness of environmental protection increased through awareness programs during construction and training and the Clean City campaign. Target outputs have also been mostly achieved except for the three canceled subproject components (para. 5). Of the remaining 24 subproject components, 3 were partly achieved due to adjustments in location and correction in capacity calculation at appraisal,\(^9\) while 2 were partly achieved due to the lack of time to complete the

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\(^9\) Partial achievement of three targets due to miscalculation of capacity at appraisal and adjustment in location of related subprojects: Output 2.1. Flood control facilities in Kelijiang River: permanent Xiangsihu Lake was created with a retaining capacity of 1.65 million m\(^3\) compared with the 4.38 million m\(^3\) target; Output 2.2. Wastewater collection facilities along Kelijiang River: a 38.4 km sewerage pipeline was built compared with the 47.75 km target; and Output 4.1. Expanded and improved forest at Qingxiushan Park: reforested 41.1 hectares (ha) compared with the 71 ha target.
Based on the reported achievements at the outcome and outputs at completion, this validation also rates the project effective.

C. Efficiency of Resource Use in Achieving Outcome and Outputs

12. The PCR rated the project efficient. Project activities under subproject 1 (Xinxujiang River Environmental Upgrading) were delayed by 1 year; and activities under subproject 2 (Kelijiang River Environmental Upgrading) were delayed by 2 years. Three subproject components were canceled and completed under domestically financed projects. Project implementation was delayed by 2 years with a cost overrun of $69.3 million (or 44.7% higher than original cost) due to the higher-than-anticipated land acquisitions, resettlement standard compensations, and design changes.

13. At completion, the recalculated economic internal rates of return for the individual project subcomponents ranged from 14.3% to 24.9%, compared with a slightly lower 11.2% to 24% range at appraisal; and exceeded the economic cost of capital of 12%. This validation agrees with these findings and notes that the cost overruns mainly in land acquisition have been offset by benefits such as substantial increase in land values, expanded solid waste services, and improved wastewater treatment due to improved flood protection. With these considerations, the project is rated efficient.

D. Preliminary Assessment of Sustainability

14. The PCR rated the project likely sustainable. Of the four subprojects, two were intended to improve the living conditions of people living along the banks of the Xinxujiang and Kelijiang rivers in Nanning City, and the other two on solid waste management and Qingxiushan Park ecological upgrading were intended to generate revenue. For the first two subprojects—environmental upgrading of the Xinxujiang and Kelijiang rivers—land values increased because of environmental and water quality improvement; this contributed to the NMG’s tax revenues, which had increased substantially from CNY15 billion in 2006 to CNY42 billion in 2012, with an average annual growth rate of 23.3%. The increased revenues would provide funds for the operation and maintenance of both subprojects. Ideally, there should be some evidence of budget allocation for this purpose.

15. The financial viability of the project’s two revenue-generating components was reevaluated at project completion. The recalculated financial internal rate of return (FIRR) for the SWM component was 8.0%, compared with 9.4% at appraisal; and the FIRR of the Qingxiushan Park ecological upgrading subproject was 5.4%, compared with the original at 7.9%. Both FIRRs are still higher than the recalculated weighted average cost of capital of 1.7% for the SWM subproject and 3.2% for the park subproject.

16. However, sensitivity analysis indicated that if revenues would drop by 10% less than forecasted, the park subproject would not remain financially viable. For the SWM subproject, despite the tariff increase in 2007 and 2011, revenues were still not sufficient to fully cover operation and maintenance costs. If the tariff for solid waste management remains the same, budget support from the NMG would be required to sustain the subproject’s operations, assuming that trained staff are in place. Nevertheless, this validation also rates the project

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10 Partial achievement of two targets due to lack of time, and Output 3.1. Domestic solid waste transfer facilities: of the 22 transfer stations to be constructed, only 11 were completed and 1 was upgraded. Respective loading and compacting equipment were also provided for the 12 transfer stations.
likely sustainable mainly because the support and commitment of the NMG to city development and environmental upgrade are expected to continue.

E. Impact

17. The project’s expected impact was to enhance urban environment and public health in Nanning City. The PCR did not discuss achievement of the impact targets, which were (i) increased public satisfaction with the urban environment, (ii) increased number of visitors to Qingxiushan Park from 1.3 million in 2004 to 2 million in 2010, and (iii) reduced incidence of dysentery and diarrhea by 10% from 2004 levels of 4.26 and 52.37 per 100,000 persons, respectively. At the time of PCR preparation, no data on the achievement of the first performance indicator on public satisfaction were available. The design and monitoring framework noted that a socioeconomic satisfaction survey was not carried out at project completion, since it was considered too early to do so. The latter two impact targets have been successfully achieved.

18. The PCR addressed impact on safeguards compliance—environmental impact, land acquisitions and resettlement, indigenous peoples, and social impact—but provided individual ratings only for the first two impacts. No collective rating was given.

19. Environmental impact. The project was classified as environment category A at appraisal. The Nanning Municipal Environmental Monitoring Station reported no significant negative impact on the environment during project construction, and no complaints related to environmental safeguards during implementation. The project generated significant environmental benefits such as reduced risk of floods within the project area; improved water quality; reduced solid waste; and control of airborne dust, odors, and disease vectors; increased green area in the city; and improved biodiversity in the park.

20. Land acquisition and resettlement. The resettlement of affected households was completed in 2013. Actual land acquisition was 5% greater than estimated, but total house demolition was 29,803 m² (67%) lower than estimated. However, the affected persons refused to relocate because of the low quality of roads and lack of other basic amenities; this led to higher compensation rates and a revision in the design for construction to progress smoothly. Thus, resettlement costs substantially increased by more than 60%. To support the farmers who lost land, the NMG allocated about 40 m² of commercial urban land to maintain their livelihoods. A strong internal and external monitoring system was established to monitor land acquisition and resettlement, which were completed successfully despite delays and cost overruns. All affected households have been compensated and relocated, and their respective incomes restored.

21. Indigenous peoples. The project was classified as category B for indigenous peoples. The project area was populated mainly by Han people. The affected Zhuang people were given the same entitlements as the Han people.

22. Overall, based on the discussion above, this validation rates the project’s net positive impact as significant.
III. OTHER PERFORMANCE ASSESSMENTS

A. Performance of the Borrower and Executing Agency

23. The PCR rated the performance of the NMG as borrower and executing agency *highly satisfactory*. It noted that despite major design changes caused by the implementation of the Water City Plan, resettlement issues, limited experience in ADB procedures, and lengthy negotiation agreements, the borrower, and executing agency demonstrated strong commitment, which resulted in the achievement of all project outcomes. The project was delayed by 2 years because of challenges in carrying out the planned construction works, which included resolving resettlement problems. Despite the executing agency's efforts to raise the SWM tariff, much has yet to be done to increase SWM tariff toward full cost recovery. This validation rates the performance of both the borrower and executing agency *satisfactory*.

B. Performance of the Asian Development Bank

24. The PCR rated ADB’s performance *satisfactory*. ADB conducted 11 review missions, including the midterm review during project implementation, which the PCR considered adequate. ADB interacted closely with all project stakeholders to resolve implementation issues. ADB cooperated well with the NMG and implementing agencies, reviewed and processed procurement documents efficiently, and dealt with the requests of the borrower and the executing agency promptly. The NMG and implementing agencies as noted in the borrower’s PCR highly appreciated ADB’s cooperation. This validation also rates ADB’s performance *satisfactory*.

IV. OVERALL ASSESSMENT, LESSONS, AND RECOMMENDATIONS

A. Overall Assessment and Ratings

25. The PCR rated the project’s overall performance *successful*. It was *highly relevant, effective, efficient, and likely sustainable*. This validation assesses the project *relevant, effective, efficient, and likely sustainable*. Despite the implementation delays and 2-year loan extension, the intended outcomes of the project have been achieved. The net expected environment and social impact was *significant*. Based on the reviews for relevance, effectiveness, efficiency, and preliminary assessment of sustainability, this validation also rates the project *successful*.

Overall Ratings

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**B. Lessons**

26. The PCR gave several lessons upon project completion (PCR, paras. 57–61). This validation agrees with these lessons: (i) institutional arrangements—PMO’s strong leadership and awareness of its critical role in the coordination process, experience with ADB procedures, and good communication skills are desirable; (ii) consultant recruitment and procurement—early recruitment of consultants and national competitive bidding can reduce project delays; and (iii) resettlement—the PCR noted that allocating commercial land to affected persons is a good practice for maintaining long-term income sources for affected persons; and can be replicated in other ADB projects.

**C. Recommendations for Follow-Up**

27. Reflecting on the lessons learned, the main recommendation would be to carefully evaluate the project design, cost, and implementation schedule jointly with the borrower and other relevant stakeholders to avoid any design change, resettlement issues, and delays during implementation, including sustainability issues. This validation concurs with the PCR’s other recommendations. This validation also recommends a mechanism to be devised for estimating future project costs to accommodate unexpected price changes such as land value increases.

**V. OTHER CONSIDERATIONS AND FOLLOW-UP**

**A. Monitoring and Evaluation Design, Implementation, and Utilization**

28. The report and recommendation of the President (RRP) and the project administration manual noted that the PMO should have established the project performance monitoring system to monitor performance indicators and record arrangements 6 months after loan effectiveness (RRP, paras. 45–47, project administration manual, paras. 36–39). This validation notes that there was neither evidence nor discussion provided in the PCR on the design, implementation, and establishment of the project monitoring and evaluation system to monitor the progress of outcome and impact. This validation believes that actual data on the achievement of outcome performance indicators had been collected only once after project completion.

**B. Comments on Project Completion Report Quality**

29. The PCR was prepared following the requisite guidelines on ADB’s Project Administration Instruction (PAI) 6.07. Its analyses were clear and the document provided...
comprehensive information. However, the PCR lacked organization in assessing the evaluation criteria. The relevance section discussed achievements; the effectiveness section discussed only one outcome performance target out of six and few outputs; and the efficiency section discussed the FIRR. No assessment was made of the project monitoring and evaluation system, and even no evidence of its establishment was presented. Although the discussion on project impact was adequate, no rating was provided. Despite these issues, the quality of the PCR is considered *satisfactory*.

C. **Data Sources for Validation**

30. This validation used the RRP, the PCR, the government PCR, and loan review mission reports as data sources.

D. **Recommendation for Independent Evaluation Department Follow-Up**

31. The PCR recommended that a project performance evaluation report should be prepared for the project by 2018. This validation supports this recommendation, but with the caveat that selection of the project performance evaluation report will also depend on the Independent Evaluation Department’s work program at the time. Further evaluation is needed to fully assess the sustainability of the project. In particular, the financial viability of two revenue-generating components has to be reevaluated, including solid waste management tariff increase and the FIRR for the park ecological upgrade. The socioeconomic and environmental survey should also be conducted to evaluate actual impact to the public. Given its significant resettlement issues, this project could also be a part of the sample for the planned phase 2 of the safeguard study.