



Completion Report

Project Number: 40642-013
Loan Number: 2491
September 2017

People's Republic of China: Guangxi Wuzhou Urban Development Project

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Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – yuan (CNY)

		At Appraisal (18 November 2008)	At Project Completion (21 April 2017)
CNY1.00	=	\$0.1465	\$0.1508
\$1.00	=	CNY6.83	CNY6.63

ABBREVIATIONS

ADB	–	Asian Development Bank
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
GDP	–	gross domestic product
GFEWS	–	geographic forecasting and early warning system
GIS	–	geographic information system
GZAR	–	Guangxi Zhuang Autonomous Region
O&M	–	operation and maintenance
PMO	–	project management office
PRC	–	People's Republic of China
WMG	–	Wuzhou Municipal Government

WEIGHTS AND MEASURES

ha	–	hectare
km	–	kilometer
km ²	–	square kilometer
m ²	–	square meter
<i>mu</i>	–	a Chinese unit of measurement (1 <i>mu</i> = 0.06667 m ²)

NOTES

- (i) The fiscal year (FY) of Government ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	People's Republic of China
2.	Loan Number	2491
3.	Project Title	Guangxi Wuzhou Urban Development Project
4.	Borrower	People's Republic of China
5.	Executing Agency	Wuzhou Municipal Government
6.	Amount of Loan	\$100 million
7.	Project Completion Report Number	1666

B. Loan Data

1.	Appraisal	
	– Date Started	waived
	– Date Completed	waived
2.	Loan Negotiations	
	– Date Started	17 November 2008
	– Date Completed	18 November 2008
3.	Date of Board Approval	15 December 2008
4.	Date of Loan Agreement	29 April 2009
5.	Date of Loan Effectiveness	
	– In Loan Agreement	30 July 2009
	– Actual	30 July 2009
	– Number of Extensions	Nil
6.	Closing Date	
	– In Loan Agreement	31 December 2014
	– Actual	31 December 2016
	– Number of Extensions	One (1)
7.	Terms of Loan	
	– Interest Rate	London interbank offered rate (LIBOR) plus 0.6% less a credit of 0.40%
	– Maturity (number of years)	25
	– Grace Period (number of years)	5
8.	Disbursements	
a.	Dates	
	Initial Disbursement	Final Disbursement
	15 October 2009	25 July 2017
	Effective Date	Original Closing Date
	30 July 2009	31 December 2014
		Time Interval
		93 months
		65 months

b. Amount (\$ million)						
Category or Subloan	Original Allocation	Last Revised Allocation	Amount Cancelled	Net Amount Available	Amount Disbursed	Undisbursed Balance
01 Civil Works	82.68	92.52	2.01	90.51	90.51	0.00
01A	12.23	10.30	0.02	10.28	10.28	0.00
01B	70.45	46.07	0.15	45.92	45.92	0.00
01C		3.29	0.01	3.28	3.28	0.00
01D		32.86	1.83	31.03	31.03	0.00
02 Equipment	6.09	2.58	0.04	2.54	2.54	0.00
03 Project Management	2.00	2.40	0.00	2.40	2.40	0.00
04 IDC	9.23	2.50	0.00	2.50	2.50	0.00
99						
Total	100.00	100.00	2.05	97.95	97.95	0.00

C. Project Data

1. Project Cost (\$ million)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	100.00	97.95
Local Currency Cost	163.34	144.78
Total	263.34	242.73

2. Financing Plan (\$ million)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower Financed	63.90	4.50
ADB Financed	90.71	95.45
Other External Financing	80.88	111.88
Subtotal	235.49	211.83
IDC Costs		
Borrower Financed	18.57	28.40
ADB Financed	9.28	2.50
Other External Financing	0.00	0.00
Total	263.34	242.73

ADB = Asian Development Bank, IDC = interest during construction.

3. Cost Breakdown by Project Component (\$ million)

Subprojects	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total
A. Project Expenditure						
1 Pingminchong geohazard resettlement and prevention	12.45	43.05	55.50	13.56	36.49	50.05
2 Hongling road network	76.27	101.66	177.93	79.49	79.89	159.38
3 Capacity building and project management	2.00	0.06	2.06	2.40	0.00	2.40
Subtotal (A)	90.72	144.77	235.49	95.45	116.38	211.83
B. Interest during Construction (B)	9.28	18.57	27.85	2.50	28.40	30.90
Total (A+B)	100.00	163.34	263.34	97.95	144.78	242.73

4. Project Schedule

Activity	Date	
	Appraisal	Actual
I. Completion of Engineering Designs		
Pingminchong geohazard resettlement and prevention	May 2008	April 2011
Hongling road network and related infrastructure	May 2008	October 2009
II. Civil Works		
Date of Contract Award		
CA01: Civil works for Zaochong resettlement community (I)	April 2008	November 2009
CA02: Civil works for Zaochong resettlement community (II)	April 2008	December 2009
CA03: Civil works for Pingminchong Valley rehabilitation	January 2009	December 2010
CB01: Civil works for Hongling Road No. 1	October 2008	March 2010
CB02: Civil works for Hongling Road No. 2	March 2008	October 2009
CB03: Civil works for Hongling roads 8, 11, 14–16, and 20	October 2008	February 2010
CB04: Civil works for Hongling roads 9, 10, 12, and 13	October 2008	February 2010
CB05: Civil works for Hongling roads 17 and 19	October 2008	August 2013
CB06: Civil works for Hongling roads 3 (E) and 18	October 2008	July 2011
CB07: Drainage works for Hongling Road No. 1	October 2008	November 2011
CB08: Civil works for Hongling roads 36 and 37	October 2008	November 2010
CB09: Landscaping for Hongling roads 1, 8, 15, 20, and 21	October 2008	July 2011
CB11: Landscaping for Hongling roads 36 and 37	October 2008	December 2012
CB12: Civil works for Hongling Road No. 3 (W)	October 2008	August 2013
Date of Completion of Works		
CA01: Civil works for Zaochong resettlement community (I)	March 2012	June 2012
CA02: Civil works for Zaochong resettlement community (II)	December 2011	December 2013
CA03: Civil works for Pingminchong Valley rehabilitation	March 2011	September 2015
CB01: Civil works for Hongling Road No. 1	December 2010	January 2014
CB02: Civil works for Hongling Road No. 2	June 2010	June 2011
CB03: Civil works for Hongling roads 8, 11, 14–16, and 20	September 2010	December 2012
CB04: Civil works for Hongling roads 9, 10, 12, and 13	December 2009	December 2012
CB05: Civil works for Hongling roads 17 and 19	December 2009	September 2016
CB06: Civil works for Hongling roads 3 (E) and 18	December 2009	September 2015
CB07: Drainage works for Hongling Road No. 1	December 2009	September 2016
CB08: Civil works for Hongling roads 36 and 37	December 2009	January 2014
CB09: Landscaping for Hongling roads 1, 8, 15, 20, and 21	December 2009	September 2013
CB11: Landscaping for Hongling roads 36 and 37	December 2009	August 2016
CB12: Civil works for Hongling Road No. 3 (W)	December 2009	September 2016
III. Equipment		
Date of Contract Award		
GB01: Traffic control and lights for Hongling roads 1,8–15,18,20,21, and 26	October 2008	April 2013
GB03: Traffic control and lights for Hongling roads 36 and 37	June 2008	July 2013
IV. Consultants		
Date of Contract Award		
CS-Capacity Building, Management and Implementation Consulting Firm	December 2009	December 2009
V. Start of Operations		
Zaochong resettlement community	October 2008	August 2011
Pingminchong Valley resettlement and prevention	June 2008	October 2009
Hongling Road network and related infrastructures	June 2008	October 2009

5. Project Performance Report Ratings

Ratings		
Implementation Period	Development Objectives	Implementation Progress
From 2008 to 2016	Satisfactory	Satisfactory

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members
TA fact-finding	4–5 July 2007	1	23	a
TA inception	18–24 February 2008	2	12	a, b
TA interim	24–27 April 2008	2	12	a, b
Loan fact-finding (I)	26 May–4 June 2008	2	12	a, b
Loan fact-finding (II)	28 July–2 August 2008	2	22	a, b
Loan inception	24–29 June 2009	5	40	a, e, h, i, j
Loan review 1	6–9 April 2010	3	12	a, b, c
Loan review 2	21–23 February 2011	3	9	e, b, h
Loan review 3 (midterm)	30 August–5 September 2011	5	35	e, b, h, i, i
Loan review 4	16–19 April 2012	3	12	e, b, h
Loan review 5	1–3 June 2013	1	3	e
Loan review 6	17–19 December 2013	2	6	e, b
Loan review 7	19–22 October 2015	2	8	e, h
Loan review 8	14–18 November 2016	1	5	e
Project completion review	17–21 April 2017	5	25	k, l, i, m

a = financial specialist, b = resettlement specialist, c = social development and/or poverty reduction specialist, d = environment specialist, e = urban development specialist, f = economist specialist, g = procurement specialist, h = project analysis specialist, i = staff consultant, j = project assistant, k = senior project implementation assistant., l = urban development specialist and/or young professional, m = associate project analyst.

I. PROJECT DESCRIPTION

1. For centuries, Wuzhou has served as a gateway city and a regional transportation hub connecting Guangxi Province in the the People's Republic of China (PRC) with national and international markets, particularly via river transportation because of its location near two big rivers, Xunjiang and Guijiang.¹ The rivers, however, separate this medium-sized city into three parts and, together with the poor mountainous geological and geographic conditions, provide limited flat land areas for urban development. Wuzhou residents had to build their houses on marginal lands, which gradually expanded up the mountains along slopes of major valleys. Therefore, they are vulnerable to rain-triggered geological disasters (known as geohazards) such as landslides, slope collapse, and mud and debris flows. Many of these densely populated valleys have been classified as geohazard-prone zones.

2. With these difficulties, Wuzhou gained strong policy support from the provincial government as Guangxi was included as one of the 12 less-developed western provinces and autonomous regions supported by the PRC under a National Strategy for Development of the West. Launched in 1999, the strategy was to assist these areas in accelerating their economic development. With support from central and provincial governments, the Wuzhou Municipal Government (WMG) was able to make significant investments to strengthen the control of geological disasters. However, traditional control and prevention measures, particularly the repeated building of slope protections and retaining walls, were not always optimal and economical, leaving people living in geohazard-prone valleys vulnerable to landslides despite the existence of concrete retaining walls.² To strengthen urban sustainability and to provide people with safe and more secure living conditions, Wuzhou needed to adopt a new approach to address geohazards more effectively.

3. On 15 December 2008, the Asian Development Bank (ADB) responded to this critical need by approving a loan of \$100 million for the Guangxi Wuzhou Urban Development Project,³ covering three districts of Wuzhou City.⁴ The loan became effective on 30 July 2009 and closed on 31 December 2016. The expected project impact was to provide sustained urban development and higher living standards in Wuzhou, to be achieved through economic growth, steady urbanization, less vulnerability to geohazards, and a more effective geohazard management system. The expected outcomes were reduced (i) geohazard threats to life and property of people living in Wuzhou, and (ii) geohazard constraints on urban development. The project included three outputs: (i) Pingminchong Valley geohazard resettlement and prevention, (ii) Hongling road network and related infrastructure, and (iii) capacity development and institutional building.

¹ The city is at the intersection of two major rivers—Xunjiang River and Guijiang River, which are then merged into the Xijiang River—the upstream section of Zhujiang River (i.e., Pearl River) for the Pearl River Delta—one major growth engine of the PRC.

² On 8 June 2006, a strong rainstorm that hit Wuzhou triggered 181 landslides, 48 slope collapses, and 64 mud flows, which killed 12 people, wounded 26, affected 21,673, and destroyed 825 buildings with a loss of CNY30 million.

³ ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Guangxi Wuzhou Urban Development Project*. Manila.

⁴ In the context of the Guangxi Wuzhou Urban Development Project, Wuzhou refers only to the city itself, comprising the three urban districts and covering a developed urban area of 50 square kilometers with a population of 486,000.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

4. The project design was highly relevant to country and sectoral strategies, at appraisal and completion. At the time of appraisal, the project was consistent with ADB's country partnership strategy for the PRC, 2008–2010, which prioritized direct support to resolve constraints to sustained urban development and urban environment improvement in smaller and less-developed interior cities as one major operational focus.⁵ The project was designed in line with the PRC's Eleventh Five-Year Plan for the prevention and control of geohazards for 2006–2010,⁶ which established the goals and principles for combating geohazards across the country and played a demonstration role for other PRC cities under similar geological conditions.⁷ Locally, the project responded to the priorities of the WMG's *Short-Term Plan for Geohazard Prevention and Control in Urban Area of Wuzhou (2003–2005)*, the *Wuzhou Urban Geohazard Prevention and Control Master Plan (2006)*, and the *Circular on Strengthening Geohazard Prevention and Control for Construction Projects (2006)*.⁸ It also supports the implementation of the Wuzhou City Development Master Plan 2000–2020, which envisages an increase to 80 square kilometers (km²) of developed urban area and an urban population of 800,000 by 2020.

5. At completion, the project remains consistent with the government's Twelfth Five-Year Plan, 2010–2015 and Thirteenth Five-Year Plan, 2016–2020, which reinforce innovations and coordinated approaches to overall socioeconomic development and continued emphasis on avoidance, prevention, rehabilitation, early warning and forecasting, and preparedness and emergency response.⁹ The project is also aligned with new emerging priorities and interventions to further develop Wuzhou into a regional multimodal transportation center to connect Guangxi with the Pearl River Delta. The urban expansion in Wuzhou supported under this project allows the city to accommodate new infrastructure facilities and their operations. The project is also aligned with the PRC's country partnership strategy, 2016–2020 that emphasizes translating innovative ideas into actual projects and programs for implementation, and supporting transformative and demonstration projects and programs that can be replicated and scaled up.¹⁰

6. The project design prepared under the project preparatory technical assistance was sound and went through adequate due diligence.¹¹ Based on experience, the project included a comprehensive design to address the shortage of land areas for urban development through a two-pronged approach, combining the rehabilitation of existing but high-risk land with infrastructure development in new expanded areas of the city. These interventions were also complemented by significant capacity strengthening for the city officials to ensure sustainability. The new approach

⁵ ADB. 2008. *Country Partnership Strategy: People's Republic of China (2008–2010)*. Manila.

⁶ Government of the PRC, National Development and Reform Commission. 2006. Outline of the *Eleventh Five-Year Plan for National Economic and Social Development of the People's Republic of China*. Beijing (adopted in 2006).

⁷ Ministry of Land and Resources. 2007. *Eleventh Five-Year Plan for Prevention and Control of Geohazard*. Beijing.

⁸ Wuzhou Municipal Government. 2003. WMG's *Short-Term Plan for Geohazard Prevention and Control in Urban Area of Wuzhou (2003–2005)*. Wuzhou; Wuzhou Municipal Government. 2006. *Wuzhou Urban Geohazard Prevention and Control Master Plan*. Wuzhou; and Wuzhou Municipal Government. 2006. *Circular on Strengthening Geohazard Prevention and Control for Construction Projects*. Wuzhou.

⁹ Government of the PRC, National Development and Reform Commission. 2010. Outline of the *Twelfth Five-Year Plan for National Economic and Social Development of the People's Republic of China*. Beijing (adopted in 2010); and Government of the PRC, National Development and Reform Commission. 2015. Outline of the *Thirteenth Five-Year Plan for National Economic and Social Development of the People's Republic of China*. Beijing (adopted in 2016).

¹⁰ ADB. 2016. *Country Partnership Strategy: People's Republic of China (2016–2020)*. Manila.

¹¹ ADB. 2007. *Technical Assistance Report to the People's Republic of China for Preparing the Wuzhou Urban Development Project*. Manila (TA 4960-PRC).

to geohazard management shifting from disaster rehabilitation to prevention was considered innovative and proved successful as the WMG continued to advance funds for replication in other areas. In the design process, the project adopted key lessons from previous ADB urban development projects in the PRC, particularly the following: (i) the use of holistic urban planning and integrated public investment as effective instruments in strengthening urban sustainability and improving human settlement, and (ii) the introduction of ADB's land acquisition and resettlement safeguard policy as a sample of international good practice based on "people-centered" principles. As such, stakeholders were consulted during planning, design, and implementation to determine the project scope and interventions.

B. Project Outputs

7. The project delivered most of the expected outputs as envisaged. The updated project design and monitoring framework is in Appendix 1. The main events in project implementation are presented chronologically in Appendix 2. A summary of the estimated works at appraisal and achievement at completion is provided in Appendix 3. A brief review of the status of completion of project outputs are provided in paras. 8–15.

1. Pingminchong Valley Geohazard Resettlement and Prevention

8. The output comprised (i) building a resettlement community in Zaochong—a geohazard-free urban area to be equipped with quality housing and municipal infrastructure to accommodate about 6,823 people or 1,816 households to be evacuated from the geohazard-prone Pingminchong Valley, and (ii) undertaking geohazard-control engineering measures to convert the evacuated Pingminchong Valley into geohazard-free land with a total area of about 20 hectares (ha) for urban redevelopment.

9. The resettlement process for Pingminchong residents was fast-tracked in response to a land slide incident on 12 June 2009, after which the WMG decided to evacuate 1,721 families and 24 enterprises (6,505 persons in total) to ensure their safety. Since the Zaochong resettlement community was not available at that time, the WMG purchased 2,690 commercial apartment units ready for occupancy based on people's needs and capacity to pay in eight different locations within the city. The Zaochong resettlement community was completed in March 2012, 1 year ahead of schedule, with more than 4,000 residential units to accommodate the resettled families from Pingminchong Valley and other geohazard-prone valleys, such as the Shiguchong and Bingquanchong valleys where the Pingminchong Valley geohazard resettlement and prevention model was replicated. The rehabilitation of Pingminchong Valley included (i) cutting the mountain slopes to a degree that is safe and free of landslides, (ii) filling up the valley into carefully designed terraces, and (iii) installing an effective drainage system to divert the storm water and protect the treated terraces from erosion. The rehabilitation was completed in September 2015, returning 19.3 ha of geohazard-free land to the city for future urban growth.

10. At appraisal, setting up a revolving fund was proposed (using funds from the sale of the rehabilitated land in Pingminchong Valley) to finance future geohazard control and prevention projects in the city. During implementation, however, the WMG recognized that establishing such a financing mechanism would face many regulatory and administrative hurdles and delays that could impact on the ability to address real-time geohazard threats for residents. Capitalizing on the successful model of Pingminchong, the WMG decided to advance funds from its own budget to rehabilitate three other adjacent valleys under geohazard threat and auction off all four valleys together once works are completed by the end of 2019. At completion, it was confirmed by the

WMG that geohazard prevention continued to be a priority under the newest cities' master plan and that adequate future budget allocations were in place.

2. Hongling Road Network and Related Infrastructure

11. The planned output entailed building a comprehensive 36.2 kilometer (km) urban road network together with related municipal infrastructure (e.g., drainage pipelines, sewers, public green areas, lighting, and traffic management facilities) to promote and facilitate urban expansion into the geohazard-free Hongling—a new urban area of about 540 ha on the northern bank of Xunjiang between the newly constructed railway station and the fully developed urban area.

12. During implementation, there was a slight adjustment in the road length from 36.2 km to 32.5 km because of (i) required design changes based on the updated development plan for the Hongling new urban district, and (ii) the cancelation of roads 5 and 30 (about 2.5 km long) because of a considerable increase in house demolition impacts and resettlement costs.¹² Out of the 32.5 km road network, ADB funded 28.7 km and domestic funds are being used to build the remaining sections of about 3.8 km.¹³ The challenges of negotiating with project affected persons and potential cost overruns in resettlements were the main reasons for significant delays and adjustments in this component (Appendix 15). These issues, however, did not affect the overall outcome of the geohazard-free Hongling road area urban development. At completion, the 532 ha Hongling has rapidly developed from a rural area in 2008 with a population of 4,000 residents to a thriving urban district of 96,000 residents, almost reaching the target of 100,000 by 2020.¹⁴

3. Capacity Development and Institution Building

13. The planned output included (i) developing and establishing a GIS-compatible geographic forecasting and early warning system (GFEWS) to strengthen the geohazard management of the Wuzhou City; and (ii) providing technical support, including relevant training in urban planning and geohazard management for the WMG and the project implementing agency to strengthen their capacity to meet the operational requirements of the project during implementation.

14. At completion, the project has installed 18 precipitation meters, 7 soil moisture sensors, 2 low frequency sonic detectors, 2 loud speakers, and 2 computer servers since September 2011. The GFEWS also included capacity building, namely through the preparation of a system's manuals on operations and maintenance. In 2012, the system was handed over to the Wuzhou Land Resource Bureau for operation. Under this output, the project also provided specialized consulting services to improve public awareness of geohazards and geohazard management through the existing community-based geohazard monitoring and alarm system.

15. Consultants were also recruited to support the project management office (PMO) and the implementing agency in the areas of procurement, design and supervision, tendering and contracting, contract management, financial management, compliance with environmental and social safeguards, and reporting. These implementation consultants also provided relevant

¹² A change in scope was approved in August 2012 to cancel the allocation for roads 5 and 30 because of delays in resettlement negotiations and potential cost overruns.

¹³ A change in scope was approved in December 2016 to discontinue ADB financing of Roads 17, 19, and 3 West Section. This was done due the lengthy resettlement process that delayed civil works beyond the project closing date. Consequently, ADB financed only the works undertaken up to 30 September 2016. The remaining works of these roads will be financed through domestic funds.

¹⁴ The population target of 100,000 by 2020 for the Hongling new urban district was established in the *Wuzhou Urban Master Plan (2002–2020)*, against the 2007 baseline of 4,000 people.

training to the PMO, implementing agency, contractors, construction supervision companies, external environmental and social safeguard agencies, and other stakeholders.

C. Project Costs

16. The project cost was estimated at appraisal to be the equivalent of \$263.34 million, comprising \$100.0 million in foreign currency (38.0%) and the equivalent of \$163.34 million (62.0%) in local currency. At midterm (September 2011), the cost estimate was revised to \$265.8 million, which comprised \$165.8 million in local currency and \$100.0 million in foreign currency. The ADB loan at appraisal was \$100 million, of which \$97.95 million was utilized (97.95%). Appendix 4 provides the average exchange rates used to convert the local currency to the dollar equivalent. Appendix 5 compares estimated with actual project costs.

17. Appendix 5 compares the project financing plan. The actual completion cost of the project is \$242.73 million—\$97.95 million from the ADB loan and \$144.78 million from WMG and domestic borrowings. ADB's share of financing increased from 38% at appraisal to 40% at completion.

18. The overall project cost at completion was reduced by (i) procurement savings from the competitive bidding process for civil works contracts; (ii) decreased financial charges of the ADB loan; and (iii) the cancellation of roads 5 and 30, as well as sections of roads 3 (west section), 17, and 19 under the Hongling road component, although they were offset by the increased financial charges during implementation for the domestic bank loans.¹⁵ The unutilized portion amounting to \$2.05 million was cancelled at project completion.

D. Disbursements and Financial Management

19. ADB approved a loan of \$100 million from ordinary capital resources on 15 December 2008. ADB loan proceeds were disbursed using the imprest fund procedure to facilitate disbursement, in accordance with the procedures set out in ADB's *Loan Disbursement Handbook* (2007, as amended from time to time) and detailed arrangements agreed upon between the government and ADB. The ceiling of statement of expenditures (SOEs) procedure was set at \$200,000 per individual payment. The initial advance of \$5 million was paid to the imprest account in November 2009, with additional advances of \$5 million in November 2010 and \$16.47 million in December 2016. Disbursements totaled \$97.95 million out of the original loan amount of \$100 million.

20. During the winding-up period, the executing agency was not able to submit all withdrawal applications by 30 April 2017 because of (i) the amount of advance to be liquidated, (ii) retroactive financing of previous claims due to the increase in ADB disbursement percentage up to 100%, and (iii) the volume of supporting documents necessary for the liquidation of expenditures (most payments are above the SOE ceiling and need to be claimed with supporting documents). The executing agency first requested that ADB remove the SOE ceiling of \$200,000 per individual payment for a more efficient liquidation of the imprest advance. However, ADB did not support the removal of the ceiling because (i) the closing date had already passed, and (ii) submission of supporting documents for auditing purposes was required. Rather than the SOE ceiling being

¹⁵ The amount of domestic commercial bank cofinancing (i.e., China Construction Bank, China Agricultural Development Bank, and China Agricultural Bank loans) is larger than originally estimated and was fully drawn down as of the midterm review of the project; hence, the higher interest during construction estimate. As shown in Appendix 5, this interest amount is absorbed under government charges (shown as an increase from \$18.57 million at appraisal to \$28.4 million at completion).

removed, ADB approved an extension of the winding-up period from 4 months to 7 months (up to 31 July 2017) to allow the executing agency more time to submit any remaining withdrawal applications. The liquidation of the imprest advance was completed by June 2017, within the extended 7-month winding-up period after the loan closing date of 31 December 2016. The unliquidated advance was refunded to ADB on 25 July 2017. Throughout the project life cycle, WMG and the implementing agency encountered no problems in processing reimbursement claims under various contracts. The evaluation of the imprest fund and the statement of expenditure procedures on implementation and experience of the executing agency has been positive. The actual disbursements are provided in Appendix 6.

21. The WMG and Dongtai State Assets Operations Corporation—a company wholly owned by the WMG that specializes in urban construction—maintained separate project financial statements and records for all expenditures incurred in the project in accordance with financial reporting standards acceptable to ADB. Consolidated project financial statements were prepared annually in accordance with applicable guidance and regulations, where these were generally consistent with internationally recognized accounting principles and practices. An auditor (acceptable to ADB) audited the detailed consolidated project accounts in accordance with the *Guidelines for the Audit of ADB and World Bank-Financed Projects*, and the auditing standards of the PRC (where these are consistent with the *International Standards on Auditing*). WMG submitted the audited accounts in English to ADB within 6 months of the end of each fiscal year. Review missions monitored compliance with financial reporting and auditing requirements and followed up regularly with all concerned, including the external auditor.

E. Project Schedule

22. The planned implementation steps of the components are compared with the actual sequence of events in Appendix 8. Both the WMG and ADB estimated at appraisal that all components would be completed before the loan closing date of 31 December 2014, by which date most of the project components were completed. During implementation, the project was extended in May 2014 from December 2014 to December 2016 to resolve resettlement issues in roads 17, 19, and 3 (west section).

F. Implementation Arrangements

23. The WMG was the executing agency. The implementation arrangements remained as envisaged at appraisal, and ADB found them adequate. The WMG established a project-leading group headed by the executive vice mayor of the WMG and comprised of the relevant heads of bureaus. The group provided overall policy guidance, interagency coordination, and problem-solving for project implementation. The Wuzhou Development and Reform Commission led the PMO, which was established at the WMG, and served as the secretariat of the project-leading group. The Dongtai State Assets Operations Corporation was the implementing agency, which included responsibility for the day-to-day implementation as well as the procurement of goods and works. Experienced design institutes, international tendering agency, construction supervision companies, and international and national consultants assisted the WMG, PMO, and implementing agency. The PMO and implementing agency reviewed the implementation progress of each component regularly at quarterly project review meetings.

G. Conditions and Covenants

24. All covenants were standard infrastructure project covenants and were all either complied with or not triggered during implementation. No covenant was modified, suspended, or waived

during implementation, which confirmed the relevance of these covenants throughout the lifetime of the project. Appendix 9 provides the status of compliance with covenants. The WMG and the implementing agency were generally in compliance with all loan covenants.

H. Procurement

25. The procurement of goods and works was carried out in accordance with the ADB *Guidelines for Procurement* (2007, as amended from time to time). Acquisition of supply materials was carried out on the basis of international and national competitive bidding. Because of the unfamiliarity of the implementing agency with regard to ADB procurement procedures, the implementing agency hired the China International Tendering Company to provide hands-on support for procurement and contract administration. With this support, the PMO was able to award all major contracts and carry out expected duties in a satisfactory manner.

26. The PMO proposed during implementation to change the procurement arrangement of the civil works package for Road No. 1 in the Hongling area (Hongling Road No. 1) from pre-qualification to post-qualification under the international competitive bidding procedure. Hongling Road No. 1 is standard road construction work following conventional engineering arrangements. Despite the estimated contract value of \$12.7 million that is above the international competitive bidding threshold, the package does not involve technical complexity. Adopting post-qualification procedures helped the PMO expedite the procurement procedure and ensured road construction began immediately after the rainy season. ADB approved the change in project implementation arrangements on 15 May 2009. The summary of contracts is in Appendix 10.

I. Performance of Contractors and Suppliers

27. The executing agency and implementing agency reported that the performance of all contractors and suppliers was *generally satisfactory*. All goods and services procured for the project complied with the specifications and other operational performance standards.

J. Performance of the Borrower and the Executing Agency

28. The overall performance of the executing agency and implementing agency was *satisfactory*. Most of the project outputs, except for some portions of the Hongling road network and related infrastructure, were completed well before the revised dates of completion and were of good quality. At completion, most planned target achievements were exceeded. Overall, the executing agency and implementing agency have demonstrated their capacity to formulate and appraise; arrange finance; and carry out engineering design, procurement, and construction supervision of the investments in Wuzhou, conforming to approved specifications and standards and to the satisfaction of ADB. The initiative to move people out of Pingmingchong immediately after the earthquake in 2009 and offer them various temporary housing options while Zaochong was being constructed demonstrated the executing agency and implementing agency's quick response, which also helped speed up the implementation for that component. During implementation, the WMG addressed land acquisition and resettlement issues to the best of its capacity, namely by proactively amending specific technical designs aimed at minimizing further delays.

K. Performance of the Asian Development Bank

29. ADB closely and regularly monitored project progress through review measures and quarterly progress reports, and provided useful advice in several areas, including procurement

and project management. ADB accorded timely approvals that enabled project milestones to be achieved, which contributed to smooth project implementation.

30. ADB also closely monitored project administration. ADB, the executing agency, and implementing agency held numerous tripartite meetings, which helped in the successful implementation of the project. ADB was flexible towards the technical design changes encountered in a significant number of contracts and the strong institutional arrangements of the borrower, with the PMO consistently demonstrating good capacity during the 7 years of loan implementation. Thus, ADB's overall performance is rated *satisfactory*.

III. EVALUATION OF PERFORMANCE

A. Relevance

31. The project is rated *highly relevant* because it maintained its strategic alignment at the appraisal and completion stages to national, provincial, and local strategies on economic and urban development, especially with regards to people-centered urban development, which is a key theme of the Thirteenth Five-Year Plan, 2016–2020 and the New-Type Urbanization Plan.¹⁶ It has also contributed to the emerging priorities of the government, such as the Belt and Road Initiative, as Wuzhou continues to be viewed as an important hub in enhancing regional integration.¹⁷ At appraisal, the government envisaged a continuation of this urbanization process in a cautious but steady manner.¹⁸ The aim was to establish a more balanced economic structure under an integrated market system comprising metropolitans, city clusters, and small- and medium-sized cities to serve as the national or regional growth centers to promote sustained development across the country through innovative and preventive interventions. In its five-year plan for prevention and control of geohazards, the government prioritizes a combined approach of avoidance-based urban planning, resettlement-based prevention, rehabilitation, early warning and forecasting, and preparedness and emergency response. PRC's central and local governments are pursuing urban expansion and providing a geohazard infrastructure that addresses geological constraints prevalent in many areas in the country. The project was aimed at making the urban development sector ready for expansion and responsive to the geohazards in Wuzhou.

32. The project is also aligned with ADB's country and sector strategies to invest in competitive, sustainable, and inclusive infrastructure. ADB's country strategy was to fund infrastructure projects in key sectors that contributed to economic growth.¹⁹ At project completion, ADB's strategy and policy (Strategy 2020) for the urban sector in the PRC is in synergy with the government's twelfth and thirteenth five-year plan objectives to develop infrastructure for economic growth and poverty reduction.²⁰ The innovative approach to geohazard prevention through relocation and improved forecasting and early warning systems has been praised nationally and been considered for replication within and outside Guangxi Province. Wuzhou City has advanced its own budget to replicate this model in three other geohazard-prone valleys. The project will continue to be relevant as Wuzhou continues its rapid urbanization process.

¹⁶ Government of the PRC, State Council. 2015. *National Economy and Social Development Thirteenth Five-Year Plan, 2016–2020*. Beijing.

¹⁷ Wuzhou is being developed into a multimodal regional transportation hub through domestically funded ongoing transportation projects.

¹⁸ The People's Congress of the PRC. 2006. *Eleventh Five-Year Program for National Economy and Social Development in the People's Republic of China*. Beijing.

¹⁹ ADB. 2006. *Country Strategy and Program Update: People's Republic of China (2007–2008)*. Manila.

²⁰ ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

33. The project included a comprehensive design to address the shortage of land areas for urban development in Wuzhou through a two-pronged approach, combining the rehabilitation of existing but high-risk land with infrastructure development in new expanded areas of the city. The new approach to geohazard management shifting from disaster rehabilitation to prevention was considered innovative and proved successful as the WMG continued to advance funds for it to be replicated in other areas. The financing model was viable especially for a city government to combine geohazard prevention with urban development. These interventions were also complemented by significant capacity strengthening for the city officials to ensure sustainability. Finally, the results chain was sound, and the design and monitoring framework was formulated to monitor and capture the results and outcomes of the projects, with most indicators being specific, measurable, realistic, and time-bound or possibly measured through proxy indicators to capture the essence.²¹

B. Effectiveness in Achieving Outcome

34. The project is rated *effective* for having achieved its expected outcome while managing environmental and social safeguards to ADB's required standards. At completion, the project substantially achieved its expected outcome of a reduced geohazard threat to life and property and reduced geohazard constraint on urban development in Wuzhou City, measured by (i) fewer households living in the geohazard-prone zone, (ii) more geohazard-free land for urban development, (iii) more urban roads and municipal infrastructure facilities, and (iv) stronger geohazard forecasting and early warning capabilities (footnote 3). First, the number of people relocated from the geohazard-prone Pingminchong Valley totaled 6,505 people in 1,721 households against the target of 6,823 people in 1,816 households at appraisal. Because of the success of this outcome, the WMG replicated this model in three other adjacent valleys.²² The beneficiaries that were relocated from the four geohazard-prone valleys to safe urban areas totaled 34,959 people in 7,419 households.

35. Second, the project met the target on geohazard-free land availability for future urban development in the Pingminchong Valley by constructing 18.31 ha of resettlement community, which was completed in June 2012. As a result of the replication of the Pingminchong model, the four geohazard-prone valleys were rehabilitated into 1,218.5 *mu* or 81.2 ha of geohazard-free lands for future urban development.²³ Hence the primary target of geohazard-free land was exceeded.

36. Third, the project greatly improved transport and related urban roads infrastructure and services in the new urban district of Hongling. The length of high quality roads in the Hongling district increased by 28.7 km, with traffic volume increasing from 8,000 vehicles per day in 2008 to 40,000 in 2016. The improved transport and related infrastructure along with Wuzhou's geohazard strategies helped Hongling develop into a thriving urban district of 92,000 people, well on its way to achieving the population target of 100,000 by 2020. Lastly, the emergency response time of the geohazard forecasting and early warning system was reduced by 80%, exceeding the target to reduce it by 50% from the 2007 baseline. Institutional development and capacity building activities were also implemented successfully, improving the capacity of relevant stakeholders in the city and municipality.

²¹ The design and monitoring framework is in Appendix 1.

²² Shiguchong, Bingquanchong, and Baihuachong.

²³ Together with the Zaochong resettlement community and the Hongling new urban district that were financed by the ADB loan, the total geohazard-free land made available for safe urban development was 631.4 ha.

37. Through the project, the WMG adopted new approaches to combat the geohazard concerns of the city through a shift in geohazard management from disaster rehabilitation to prevention: (i) carefully designing urban planning for long-term urban expansion, (ii) relocating people living in the geohazard-prone zone to the newly developed geohazard-free urban area, (iii) creating engineering measures for geohazard control to convert the evacuated geohazard-prone valley into a geohazard-free land for urban redevelopment, and (iv) developing stronger geohazard forecasting and early warning capabilities to improve the effectiveness of the city's geohazard management system. This model is deemed successful because the WMG replicated it in three adjacent geohazard-prone valleys in Wuzhou and it is widely recognized in the PRC as a successful Wuzhou model in managing geohazards.

38. **Environment safeguards.** The project is classified as Category A for environment impacts based on the ADB Environment Policy (2002).²⁴ A summary of environment impact assessment was prepared and disclosed with environmental management plan (EMP) on the ADB website on 14 August 2008. The WMG assigned one officer to coordinate and oversee the implementation of the EMP. The implementing agency assigned one manager and one officer in charge of environmental management. The implementing agency implemented environmental activities, including mitigation measures, environmental monitoring, information disclosure, public consultations, and a grievance redress mechanism. During construction, the contractors complied with the provisions of the EMP and effectively implemented the mitigation measures. The residual impacts were insignificant. During construction, mitigation measures suggested in the EMP for air pollution, noise, wastewater, solid waste, revegetation, and health and safety were adequately implemented with appropriate cost allocations. The environmental monitoring plan was properly executed in accordance with the EMP. Environmental monitoring during trial and formal operations showed that the air, water, and noise emissions during the operational phase were in compliance with national regulatory standards. The environmental monitoring and reporting requirements were adequately met, which were submitted semi-annually. The roles and responsibilities of relevant institutions for environmental management—including the contractors, supervision companies, the implementing agency, the executing agency, municipal environmental protection bureau, the municipal environmental monitoring station, and ADB and loan implementation consultants—were adequately fulfilled (Appendix 14). No grievance was received from the local community and the general public with regard to the environmental impacts of the project. All subprojects passed the project completion environmental audit by the Wuzhou municipal environmental protection bureau.

39. **Resettlement.** The project is classified as Category A for involuntary resettlement. Two resettlement plans were prepared for the two main components during loan processing in August 2008 to comply with ADB's *Involuntary Resettlement Policy (1995)*. During project implementation, ADB updated and approved the two resettlement plans in August 2009 for the Hongling component and in May 2010 for the Pingminchong component. Land acquisition and resettlement were implemented on the basis of the resettlement plans, the 1998 Land Administration Law, and the State Council Decision to Deepen Reform and Strictly Enforce Land Administration (Document 28, November 2004). There was a well-organized institutional structure for the management and implementation of the resettlement work. The consultants included internal resettlement monitoring at the beginning of the project in the progress reports between September 2009 and December 2010.²⁵ The consultants prepared 27 progress reports that included resettlement monitoring. The Wuzhou PMO engaged an external resettlement

²⁴ ADB. 2002. *Environment Policy of the Asian Development Bank*. Manila.

²⁵ Government of the PRC, State Council. 2004 *Decision to Deepen Reform and Strictly Enforce Land Administration*. Beijing.

monitoring agency (Wuzhou College) from January 2011 to December 2016. Fourteen semiannual resettlement monitoring and evaluation reports were timely submitted by the consultants to the PMO and ADB.

40. In terms of implementation, resettlement in the Pingmingchong component was fast-tracked after the land slide incident on 12 June 2009. The WMG evacuated the project-affected persons to ensure their safety and offered several resettlement housing options, the most popular one being the Zaichong resettlement site because of its various housing styles and prices. Beneficiaries were reported to be very satisfied with the move because it improved their living environment and personal safety. However, resettlement for the Hongling component was severely delayed because negotiations with 35 households in Longping Village (out of a total of 387 affected households for the component) carried on for nearly 4 years from 2013 to 2016 over the proposed compensation rates and the location of resettlement sites. Because of these delays, the concerned portion of selected roads had to be taken out of the project to be completed later with domestic funding. These 35 households signed the agreement in March 2017 and handed over the site for demolition. With these different developments, the total number of affected households is as follows: 891 households with permanent land acquisition, 2,132 households with residential house demolition, and 44 enterprises with non-residential house demolition. The actual cost of compensation for land acquisition, relocation, and other affected assets was CNY546.35 million, 88.96% of the CNY614.15 million estimated in the updated resettlement plan and 114.62% of the CNY476.65 million estimated in the original resettlement plan (Appendix 15).

41. **Gender.** The project was expected to benefit women in particular by reducing energy, time, and effort spent by women on cleaning up the community and taking care of the sick, wounded, and elderly after geohazard events, allowing them to engage more in income-generating activities, family entertainment, or leisure. Although no gender action plan was prepared for the project, the WMG aimed to prioritize at least 20% of the project-generating jobs for women. At completion, of the total 2,260 employment opportunities generated, over 30% were provided to women and over 20% to poor and ethnic minorities. In addition, the implementing agency and contractors trained the local unskilled laborers in occupational health and safety issues, including HIV/AIDS and gender sensitivity, before they started to work on the construction sites.

C. Efficiency in Achieving Outcome and Outputs

42. The project is rated *efficient* in achieving outcome and outputs. The project was implemented within budget and within the approved extended time frame. The loan extension was required mainly because of delays in land acquisition and resettlement, which required additional inputs during implementation. The extension, however, was approved to complete project outputs to standards set by ADB, especially regarding land acquisition. At project closing, the land acquisition was completed, and the remaining portion of the civil works were to be completed using domestic funds to ensure the project intended outcomes as appraised. The economic internal rate of return (EIRR) was calculated based on the project's primary benefits that stemmed from (i) land value increases because of improved infrastructure avoidance of property damage and deaths caused by geohazards; (ii) improved housing conditions and quality of life for geohazard-threatened residents of Pingminchong Valley; (iii) increases in land values because of improvements in geological conditions and infrastructure; (iv) typical benefits arising from a road project such as time savings, fuel savings, vehicle operating cost savings, and accident cost reductions through the provision of municipal road infrastructure for the Hongling area; and (v) faster gross domestic product (GDP) growth from improvements in general infrastructure. At

completion, the EIRR for the project was recalculated at 19.4%²⁶ greater than the hurdle rate of 9.0%.²⁷ The sensitivity analysis of the main parameter indicates that the impact of the risk would only reduce the EIRR to 17.4%, further underscoring the robust nature of the project's economic performance. The major assumptions used in the economic evaluation, and the detailed calculations of the EIRR are in Appendix 11.

D. Preliminary Assessment of Sustainability

43. The project is rated *likely sustainable*. Technically, the design of all outputs and technology adopted are robust and appropriate, given the technical parameters, requirements of the PRC's urban sector, and the project's long-term sustainability. The project facilities were constructed in accordance with the required engineering standards and specifications and are considered to be of sufficient quality to meet the design service life and ensure the realization of the project's benefits in the long term. The relevant authorities of Wuzhou City have been successfully operating the completed investments. Environmental benefits have also been observed by the authorities, including less soil erosion and dust from exposed slopes, reduced clogging of drainage and sanitation of waterways, better environmental amenities for resettled residents, and improved road conditions continuing to reduce the use of fuel and air emissions. The relocated residents from Pingmingchong have settled well in the Zaochong area and built a thriving community with sustainable living conditions, and the Hongling area continues to thrive as a new urban district. The institutional strengthening and capacity building component provided sufficient training and technical assistance to the WMG, the PMO, the implementing agency, and the Wuzhou Land Bureau so that they have adequate capacity to manage the operations and maintenance of project facilities. Future funding for the required operations and maintenance is not expected to be a problem for the WMG. As expressed in various public consultations during project implementation, the beneficiaries were highly satisfied with the project-supported Zaochong resettlement community and project road in Hongling. High beneficiary satisfaction provides positive support for sustainability.

44. The financial reevaluation (Appendix 12) presents the overall financial health of the WMG and the implementing agency. According to the reevaluation, the project is expected to remain financially sustainable because the WMG and the implementing agency have enough financial capacity to service debts, finance remaining capital investments, and repay the ADB and domestic loans. The technical standards and quality systems adopted and the material and equipment procured and installed are superior and are unlikely to become obsolete. The WMG, the implementing agency, and the Wuzhou Land Bureau also have in-house capacity to operate and maintain the sub-outputs effectively and efficiently. Hence, all the outputs are expected to be used optimally throughout the life of the project.

45. Confident with the Pingmingchong model, the WMG has advanced resources to scale-up the rehabilitation in three other geohazard-prone valleys and plans to auction off the whole area, proving it is a sustainable model to address geohazards and induce urban development. The institutional strengthening and capacity building component provided technical assistance to relevant agencies in the city to manage project investments. The WMG plans to extend the GFEWS coverage to the entire Wuzhou Municipality, which would benefit more than 3 million residents, and has requested for funding from the Wuzhou Development and Reform Commission. The expansion would enhance the sustainability of the system developed under the project.

²⁶ At appraisal, the EIRR was estimated at 20.7%, for the proposed investments under the project, 19.3% for the Pingminchong output, and 20.9% for the Hongling output.

²⁷ ADB. 2006. *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations*. Manila.

E. Impact

46. The expected impact of the project was sustained urban development and improved quality of life for Wuzhou City. The different indicators used to measure the level of impact of the project include: the rate of GDP growth, the increase in urban population, the rate of development for the Hongling new urban district, the proportion of urban population living in geohazard-prone areas, and a self-financing model for geohazard prevention and control. Although these impact indicators are not solely attributable to the projects, based on available data, the targets under each of these indicators were exceeded. Wuzhou has been enjoying a high GDP growth of 11.6% (as compared to the 8.0% target) during 2006–2016, and an increased urban population from 468,000 in 2005 to 808,500 in 2016. With these demographic changes, living standards have improved with an average annual growth of 12% in per capita income, while only 3% now live in geohazard-prone areas (compared to the target of 5%). In the thriving new urban district of Hongling, 60% of land area has been developed for commercial and residential projects. The project impact is rated *satisfactory*.

47. **Replicability of the project.** The Ministry of Land Resources has praised the Pingminchong geohazard resettlement and rehabilitation model as a good experience and good practice for national replication.²⁸ This initiative was viewed as a model for government leadership, interagency coordination, and diversified financing, combining engineering rehabilitation with relocation, properly resettling people, and market-based operation. Furthermore, the Guangxi Department of Land Resources plans to replicate Wuzhou's integrated model in other geohazard-prone cities of the autonomous region such as Guilin, Liuzhou, and Hechi.²⁹ In 2015, the WMG released the Geohazard Prevention and Control Plan, 2015–2020, which calls for (i) the continuation of integrated rehabilitation for the three valleys (Pingminchong, Bingquanchong, and Shiguchong); (ii) the rehabilitation of other priority geohazard sites using experience accumulated over the years, including the ADB-financed Pingminchong Valley; (iii) improving and expanding the coverage of the geohazard early warning and forecasting system; and (iv) building public awareness of geohazard prevention and control.

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

48. Overall, the project is rated *successful*, based on the ratings of *highly relevant*, *effective*, *efficient*, and *likely sustainable*. It remains *highly relevant* to the government's urban development and geohazard prevention efforts. Implemented as designed, the project's approach to geohazard resettlement is a pioneering attempt of unprecedented scale and transformed Wuzhou into a well-planned urban area. The project also provided a demonstration effect, with the geohazard model replicated in Wuzhou's valleys adjacent to the project site. The project is *effective*, substantially achieving its intended outcomes and often exceeding its indicators. The project's indirect and broader objectives have also been realized. These initiatives are considered very important steps in the urban development sector in Wuzhou. The project has met all the targets and designs established at appraisal, except for a segment of the Hongling road network. For those indicators that fell slightly short of their targets, there were clear justifications or a strong commitment from the government to complete the remaining works with counterpart funds in the near future. The

²⁸ The Wuzhou model for geohazard prevention and control has been promoted by both the Guangxi Zhuang Autonomous Region government and the national government; however, it is too early to identify any replication in the province and country. It is suggested to conduct an assessment within 3 years.

²⁹ The integrated rehabilitation of the three valleys is still ongoing; land for the other two valleys is still under rehabilitation. The decision on the timetable for land auction rests with the WMG.

project is rated *efficient*, exceeding most physical targets despite land acquisition and resettlement delays. The economic quantification of costs and benefits has indicated project efficiency. The project is rated *likely sustainable*. The WMG's strong financial position and commitment provide the basis for the project's sustainability. The WMG has the capability to maintain the project to derive maximum benefits from it. The project in general has met its objectives and generated substantial impacts on the standard of living and development in Pingminchong and Hongling, as well as adjacent areas in Wuzhou.

B. Lessons

49. Lessons learned from the implementation of the project and recommendations were identified for future ADB loan management in the PRC. In this regard, several factors were viewed as crucial for the success of the project including good alignment with government priorities, strong ownership and capacity of the local government, and receptiveness to incorporate international best practices and innovative approaches. However, two specific areas were deemed to provide more distinctive lessons learned.

50. **Resettlement.** The recent emphasis in the PRC on more people-centered policies has led to a more cautious approach by the government in implementing land acquisition and resettlement, as affected people become increasingly more vocal about their rights regarding acquired lands and disagreements with proposed compensations. Although meaningful talks with affected people are still considered the more sustainable solution, the PMO and ADB agreed that the following additional approaches were also important to improve project design and implementation: (i) minimize land acquisition as much as possible when designing project components; (ii) carry out more thorough due diligence to allow better decision-making; (iii) look for proactive approaches to resolve land acquisition bottlenecks such as design amendments and alternative resettlement locations; (iv) coordinate better across township governments in implementing resettlement plans; and (v) consider alternative project components to use loan proceeds and loan extensions more efficiently.

51. **Procurement and low bid prices.** This has been observed as a growing phenomenon across many ADB projects, as well as those funded by other donors, in the PRC. This phenomenon is a result of many issues, including overestimating during bid preparation, price analysis during bid evaluation, and low capacity of the implementing agency in contract management. Most specifically, the cost estimate in the procurement plan is based on a feasibility study report in the PRC, and the risk premium is always high in feasibility study report estimates. More advance preparation will improve the accuracy of the cost estimates. While a recent procurement reform in ADB should help address this situation,³⁰ certain additional measures should be considered to avoid further negative impacts on loan utilization. Such measures could be related to more accurate bid preparations, including detailed designs and cost estimates, and price analysis during bid evaluation. ADB and the PMO should make significant efforts to strengthen the capacity of the implementing agency on procurement matters. Improvements in the existing PRC's tracking system for sanctioned local bidders would also be essential for addressing the problem.

³⁰ The latest Procurement Regulations for ADB Borrowers refer to cases of abnormally low bids, where after careful examination, the borrower is given the option to reject the bid or request that the amount of the performance security be increased at the expense of the bidder.

C. Recommendations

1. Project Related

52. **Future monitoring.** For the remaining portions of the Hongling Road Component, it is important to continue monitoring the implementation of remaining safeguard actions and the completion of civil works at least 2 years after circulation of the project completion report. As a result, semiannual monitoring reports will be submitted to ADB. After this, the project will not require any specific follow-up action by ADB.

53. **Further action or follow-up.** More remains to be done to make Wuzhou completely geohazard-free. The WMG should capitalize on the success of this project and quickly complete the rehabilitation of the remaining three valleys for auction to generate a source of income for other geohazard management initiatives.

2. Timing of the Project Performance Evaluation Report

54. A project performance audit report mission may be fielded in the first quarter of 2019 to prepare a report.

3. General

55. **Project extensions related to land acquisition and resettlement.** Local governments in the PRC are increasingly adopting a more cautious approach towards solving land acquisition and resettlement issues. This has often led to extensions requests by the borrower in order to complete the implementation of the project. When considering such type of extension requests, ADB should undertake an extensive due diligence to assess whether the completion of the project is achievable within the proposed extended timeline. This due diligence should not be just undertaken by the project implementation consultants but also by an external specialist contracted for this specific task.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Targets	Achievement
Impact Sustained urban development and improved quality of life for Wuzhou City	<p>Wuzhou GDP growth is sustained at an average annual rate of more than 8% during 2006–2020</p> <p>Urban population increased from 468,000 in 2005 to 600,000 by 2016</p> <p>Steady growth of Wuzhou per capita income between 2006 and 2020</p> <p>20% of the new urban area of Hongling developed for commercial operation and residential use by 2016</p> <p>The proportion of urban populations living in geohazard-prone areas declined from 10% (2007) to 5% (2016)</p> <p>A new model with significant self-financing capacity for geohazard prevention and control established for geohazard mitigation projects in 2 years after project completion</p> <p>Accuracy of the geohazard forecasting and early warning service improved by 50% in 2016 from the 2007 baseline</p>	<p>Wuzhou GDP growth is sustained at an average annual rate of 11.6% during 2006–2016</p> <p>Urban population increased from 468,000 in 2005 to 808,500 by 2016</p> <p>Average annual growth of 12% in per capita income in Wuzhou between 2006 and 2016</p> <p>60% of the new urban area of Hongling developed for commercial operation and residential use by 2016</p> <p>The proportion of urban population living in geohazard-prone areas declined from 10% (2007) to 3% (2016)</p> <p>The project piloted a geohazard prevention model, whereby (i) a geohazard-free new urban district is developed for resettling people under threat, and (ii) geohazard-affected areas are rehabilitated as safe land for urban development. The model has been replicated in the three adjacent valleys of Baihuachong, Bingchuanchong, and Shiguchong, which have been rehabilitated in an integrated way.</p> <p>Accuracy of geohazard forecasting and early warning service improved by 80% in 2016 from the 2007 baseline</p>
Outcome Reduced geohazard threat to life and property and reduced geohazard constraint on urban development in Wuzhou City	<p>Families and people living under direct geohazard threat reduced by about 1,816 families or 6,823 persons from the 2008 baseline</p> <p>After systematic engineering treatment, Pingminchong Valley, a major geohazard zone of the city is ready for public auction as a geohazard-free land for urban redevelopment</p> <p>Urban transportation service improved and traffic volume significantly increased in the geohazard-free Hongling area</p>	<p>Families and people living under direct geohazard threat reduced by about 1,721 families or 6,505 persons from the 2008 baseline</p> <p>After systematic engineering treatment, Pingminchong Valley, a major geohazard zone of the city is ready for public auction as a geohazard-free land for urban redevelopment</p> <p>In the geohazard-free Hongling area, the total length of roads increased from 1.5 km in 2007 to 28.7 km at the end of 2013, and traffic volume increased from 8,000 to 40,000 vehicle-times per day</p>

Design Summary	Targets	Achievement
	Effectiveness of geohazard management improved by shortening the emergency response time by 50% from the 2007 baseline	Effectiveness of geohazard management improved by shortening the emergency response time by 80% from the 2007 baseline
<p>Outputs</p> <p>A well-serviced resettlement community is constructed in Zaochong and is equipped with quality housing and municipal infrastructure to accommodate about 7,000 people or 1,920 households to be evacuated from the geohazard-prone Pingminchong Valley.</p> <p>About 1,816 families or 6,823 people have been evacuated from the geohazard-prone Pingminchong Valley and properly relocated to the newly constructed resettlement community.</p> <p>Geohazard-prone Pingminchong Valley is systematically and thoroughly treated with anti-geohazard engineering measures to become 19.27 ha of landslide-free land for urban redevelopment.</p> <p>A 36.2 km urban road network is constructed in the Hongling area together with associated municipal infrastructure, including drainage and sewage pipelines to promote and facilitate urban expansion away from geohazard zones.</p> <p>A GIS-compatible geohazard forecasting and early warning system is introduced and put into operation to strengthen the geohazard management system.</p> <p>Substantial short-term jobs become available, reducing poverty.</p>	<p>The construction of the 18.31 ha resettlement community completed and ready for occupancy by December 2010</p> <p>The relocation of people from the geohazard-prone Pingminchong Valley completed by June 2012, and relocated families satisfied with the implementation of the relevant resettlement plan during relocation</p> <p>Engineering treatment of Pingminchong Valley completed by the end of 2013</p> <p>Construction of the urban road network in Hongling completed for traffic by December 2013</p> <p>Installation of the GIS-compatible geohazard forecasting and early warning system completed at Wuzhou Geohazard Management Center for geohazard management operation by the end of 2012</p> <p>About 2,200 short-term jobs created during project implementation, of which about 40% taken by vulnerable groups including women (about 20%), and poor and ethnic minorities (about 20%)</p>	<p>The construction of the 18.31 ha resettlement community completed and occupied in March 2012</p> <p>The relocation of people from the geohazard-prone Pingminchong Valley completed by June 2012, and relocated families satisfied with the implementation of the relevant resettlement plan during relocation. 1,721 families, 24 enterprises, 6,505 persons evacuated due to landslide incident</p> <p>Engineering treatment of Pingminchong Valley completed in September 2015 returning 19.3 ha of geohazard-free land</p> <p>First ADB-financed road opened for traffic in January 2012. At the end of 2016, the length of roads (together with associated municipal infrastructure, including drainage and sewage pipelines) totaled 28.7 km</p> <p>Installation of the GIS-compatible geohazard forecasting and early warning system completed at Wuzhou Geohazard Management Center for geohazard management operation in August 2013</p> <p>About 2,260 short-term jobs created during project implementation, of which about 50% taken by vulnerable groups including women (about 30%), and poor and ethnic minorities (about 20%)^a</p>

ADB = Asian Development Bank, GDP = gross domestic product, GIS = geospatial information system, ha = hectare, km = kilometer.

^a Short-term jobs mostly included construction worker jobs, as well as other service jobs around the construction sites. Source: Asian Development Bank.

CHRONOLOGY OF MAIN EVENTS

Date	Major Event
4–5 July 2007	TA fact-finding
18–24 February 2008	TA inception mission
24–27 April 2008	TA interim mission
26 May–4 June 2008	Loan fact-finding mission (Phase I)
28 July–2 August 2008	Loan fact-finding mission (Phase II)
(Waived)	Loan appraisal mission
15 December 2008	Board approval
29 April 2009	Loan agreement signing
29 June 2009	Project agreement signing
30 July 2009	Loan effective
30 June 2014	Project completion
30 June 2016	Extended project completion
31 December 2014	Loan closing
31 December 2016	Extended loan closing
24–29 June 2009	Loan inception mission
23 December 2009	Start of loan implementation consulting services
15 October 2009	First Disbursement
6–9 April 2010	Loan review mission 1
21–23 February 2011	Loan review mission 2
30 August–5 September 2011	Loan review mission 3 (midterm)
16–19 April 2012	Loan review mission 4
1–3 June 2013	Loan review mission 5
17–19 December 2013	Loan review mission 6
19–22 October 2015	Loan review mission 7
14–18 November 2016	Loan review mission 8
17–21 April 2017	Project completion review mission
25 July 2017	Last disbursement
31 July 2017	Loan closed

TA = technical assistance.

Source: Asian Development Bank.

ESTIMATED PHYSICAL WORKS AT APPRAISAL AND ACCOMPLISHMENTS AT COMPLETION

Appraisal	Completion
Pingminchong Valley Geohazard Resettlement and Prevention	
A well-serviced resettlement community is constructed in Zaochong and is equipped with quality housing and municipal infrastructure to accommodate about 6,823 people in 1,816 households to be evacuated from Pingminchong Valley	Zaochong resettlement community with 18.3 ha of land area and 250,000 m ² of housing space has been built with quality housing and municipal infrastructure to accommodate 10,000 people and 3,000 households, including 6,505 people in 1,721 households from the geohazard-prone Pingminchong Valley.
About 1,816 families or 6,823 people have been evacuated from the geohazard-prone Pingminchong Valley and properly relocated to the newly constructed Zaochong resettlement community	6,505 in 1,721 households were relocated from the geohazard-prone Pingminchong Valley and resettled in the newly built Zaochong resettlement community.
Undertaking geohazard-control engineering measures to convert the evacuated Pingminchong Valley into geohazard-free lands with a total area of about 20 ha for urban development	Geohazard-prone Pingminchong Valley rehabilitated with engineering measures into 19.3 ha geohazard-free land for urban development.
Hongling Road Network and Related Infrastructure	
Building a comprehensive 36.2 km urban road network with related infrastructures	As of December 2013, Hongling's new urban district, with a planned area of 691 ha to accommodate 170,000 people, had an urban road network totaling 32.5 km, including 28.7 km financed by an ADB loan.
Project Management and Capacity Building Component	
Developing and establishing a GIS-compatible geographic forecasting and early warning system to strengthen the geohazard management of the city	A GIS-compatible geohazard forecasting and early warning system has been built and operational to cover 500 km ² under threat of geohazards in Wuzhou.
Providing technical support, including relevant training in urban planning and geohazard management for the WMG and the project implementing agency to strengthen their capacity to meet operational requirements of the project during implementation	Completed.
Provide specialized consulting services under this component to improve public awareness of geohazards and geohazard management through the existing community-based geohazard monitoring and alarm system	Completed.

GIS = geospatial information system, ha = hectare, km = kilometer, km² = square kilometer, m² = square meter.
Source: Asian Development Bank.

ANNUAL AVERAGE EXCHANGE RATES

Year	CNY for every United States Dollar
2008	6.8353
2009	6.8253
2010	6.6008
2011	6.3026
2012	6.2357
2013	6.0623
2014	6.2020
2015	6.4903
2016	6.9502

CNY = Chinese yuan.

Source: Asian Development Bank.

COMPARISON OF ESTIMATED AND ACTUAL PROJECT COSTS

Components/Item	At Appraisal (\$ million)								At Completion (\$ million)							
	ADB		Domestic Borrowings		Government		Total		ADB		Domestic Borrowings		Government		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
A. Civil works	88.72	38	80.88	35	63.83	27	233.43	100	93.05	45	111.88	53	4.50	2	209.43	100
1 Pingminchong geohazards	12.45	23	29.50	53	13.55	24	55.50	100	13.56	27	34.35	69	2.14	4	50.05	100
2 Hongling road network	76.27	43	51.38	29	50.28	28	177.93	100	79.49	50	77.53	49	2.36	1	159.38	100
B. Capacity building	2.00	97	0.00	0	0.06	3	2.06	100	2.40	100	0.00	0	0	0	2.40	100
Total Base Cost	90.72	39	80.88	34	63.89	27	235.49	100	95.45	45	111.88	53	4.50	2	211.83	100
Interest during implementation	9.11	33	0	0	18.57	67	27.68	100	1.96	6	0	0	28.4	94	30.36	100
Commitment charges	0.17	100	0	0	0	0	0.17	100	0.54	100	0	0	0	0	0.54	100
Total Cost	100.00	38	80.88	31	82.46	31	263.34	100	97.95	40	111.88	46	32.90	14	242.73	100

ADB= Asian Development Bank.

Source: Asian Development Bank.

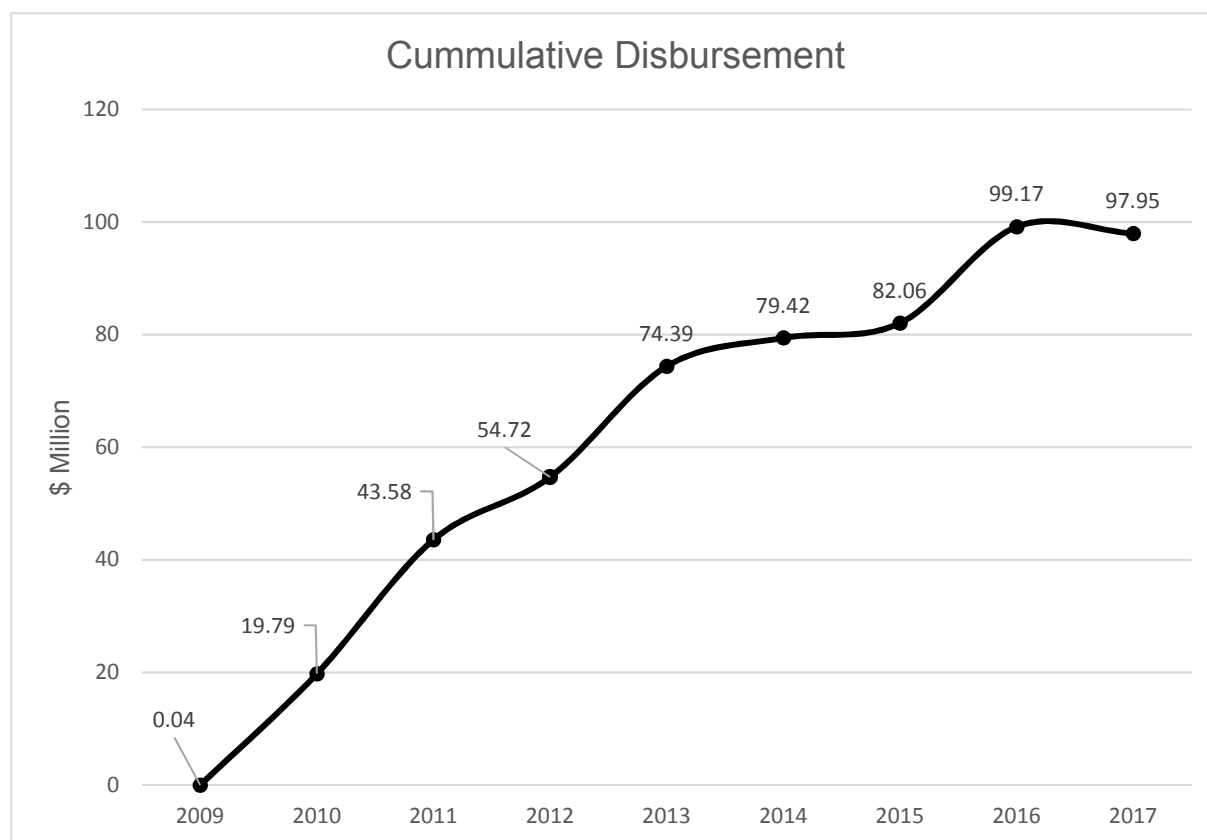
ACTUAL DISBURSEMENTS OF LOAN PROCEEDS

Table A6.1: Annual and Cumulative Disbursement of Loan Proceeds

Year	Annual Disbursement		Actual Cumulative Disbursement	
	Amount (\$ million) Actual	Annual Actual as % of Actual Total	Amount (\$ million)	% of Total
2009	0.04	0.04	0.04	0
2010	19.75	20.16	19.79	20
2011	23.79	24.29	43.58	44
2012	11.14	11.37	54.72	56
2013	19.67	20.08	74.39	76
2014	5.03	5.14	79.42	81
2015	2.64	2.70	82.06	84
2016	17.11	17.46	99.17	101
2017	-1.22	-1.25	97.95	100
Total	97.97	100		

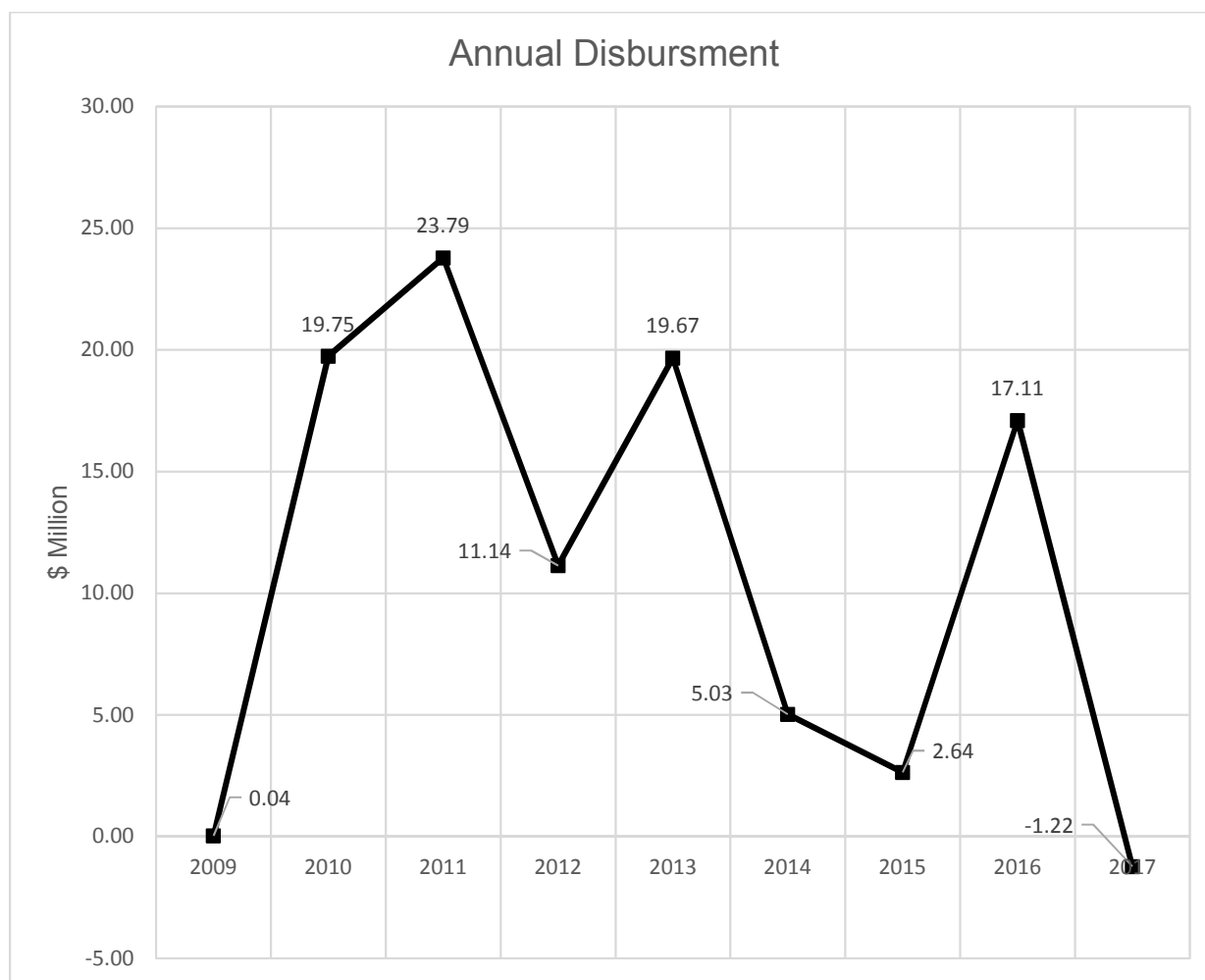
Source: Asian Development Bank.

Figure A6.1: Cumulative Disbursement of Loan Proceeds
(\$ million)



Source: Asian Development Bank.

Figure A6.2: Annual Disbursement of Loan Proceeds
(\$ million)



Source: Asian Development Bank.

PROJECT FINANCING PLAN

Source	Appraisal Estimate (\$ million)			Actual (\$ million)		
	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total
ADB	100.0	0.00	100.00	97.95	0.0	97.95
Borrowing	0.0	80.88	80.88	0.0	111.88	111.88
Executing agency	0.0	82.46	82.46	0.0	32.90	32.90
Total	100.0	163.34	263.34	97.95	144.78	242.73

ADB = Asian Development Bank.

^a Revised estimate as of January 2006.

Source: Dongtai Construction Company.


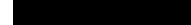

IMPLEMENTATION SCHEDULE

Component			2009				2010				2011				2012				2013				2014				2015				2016		
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3				
A. Pingminchong Valley Geohazard Resettlement and Prevention																																	
CA01	Resettlement community building in Zaochong (Civil Works)	AP																															
		Rev																															
		Act													Completed in June 2012																		
CA02	Resettlement community building in Zaochong (Utilities)	AP																															
		Rev																															
		Act													Completed in December 2013																		
CA03	Geohazard control engineering measures in Pingminchong	AP																															
		Rev																															
		Act	Completed in Sep 2015																														
B. Hongling Road Network and Related Infrastructure																																	
CB01	Construction of road 1	AP																															
		Rev																															
		Act													Completed in January 2014																		
CB02	Construction of road 2	AP																															
		Rev																															
		Act													Completed in June 2011																		
CB03	Construction of roads 8-13, & 17 Construction of roads 14-15, 20-21, 26, & a part of 8 Construction of roads 14-15, 20-21, 26, & a part of 8	AP																															
		Rev																															
		Act													Completed in November 2012																		
CB04	Construction of roads 9, 10, 12, & 13 Construction of roads 9, 10, 12, & 13 Construction of roads 9, 10, 12, & 13	AP																															
		Li																															
		Rev													Completed in December 2012																		
CB05	Construction of extension road of 5 & 21 Construction of road of 5, 17, & 19 Construction of road of 17 & 19	AP																															
		Li																															
		Rev																															
CB06	Construction of roads 3, 5, 14, 15, 16, 18, 19, 26, 28, & 29 Construction of roads 3, 17, & 18 Construction of roads 18 & a part of 3 (East section) Construction of roads 18 & a part of 3 (East section)	AP																															
		Li																															
		Rev																															
CB07	Construction of roads 20-25, 27, 30, & 31 Construction of roads 19 & 22-31 Construction of roads 30 Construction of storm water drainage pipe of road 1	AP																															
		Li																															
		Rev																															
		Act	The contract was not completed.																														

Component			2009				2010				2011				2012				2013				2014				2015				2016			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
CB08	Construction of extension road of 35	AP																																
	Construction of extension road of 36 & 37	Rev																																
	Construction of extension road of 36 & 37	Act																																
			Completed in January 2014																															
CB09	Tree planting and landscape for roads 1, 2, 8-13, 17	AP																																
	Road landscape for roads 1, 8-15, 20, & 21	Rev																																
	Road landscape for roads 1, 8-15, 20, & 21	Act																																
			Completed in September 2013																															
CB10	Tree planting and landscape for roads 3, 5, 14-16, 18-31	AP																																
	Road landscape for roads 3, 5, 17-19, 26	Rev																																
	Road landscape for roads 3, 17-19, 26	Act																																
			Cancelled																															
CB11	Tree planting and landscape for road 35	AP																																
	Road landscape for roads 36-37	Rev																																
	Road landscape for roads 36-37	Act																																
			Completed in August 2016																															
CB12	Construction of road of a part of 3 (West section)	AP																																
	Construction of road of a part of 3 (West section)	Rev																																
	Construction of road of a part of 3 (West section)	Act																																
			The contract was not completed.																															
GB01	Streetlight and signal installation for roads 1, 2, 8-13, 17	AP																																
	Traffic co. and facility for roads 1, 8, 9, 11-15, 18, 20, 21, & 26	Rev																																
	Traffic co. and facility for roads 1, 8, 9, 11-15, 18, 20, 21, & 26	Act																																
			Completed in August 2016																															
GB02	Streetlight and signal installation for roads 3, 5, 14-16, 18-31	AP																																
	Traffic control and facility for roads 3, 5, 17, 19, & 30	Rev																																
	Traffic control and facility for roads 3, 17 & 19	Act																																
			Cancelled																															
GB03	Streetlight and signal installation for road 35	AP																																
	Traffic control and facility for roads 36-37	Rev																																
	Traffic control and facility for roads 36-37	Act																																
			Completed in January 2016																															
C. Capacity Development and Institutional Building																																		
CS	Capacity building, management and implementation consultancy	AP																																
		Rev																																
		Act																																
			Comp in Dec 2016																															

AP = appraisal (September, 2008), Rev = revised (September, 2011), Act = actual.

Source: Asian Development Bank, Wuzhou Project Management Office, Wuzhou Dongtai State Assets Investment and Management Co.

 = appraisal
 = revised
 = actual

STATUS OF COMPLIANCE WITH MAJOR LOAN COVENANTS

Covenant	Reference in Loan and Project Agreements	Status of Compliance
Loan Agreement		
The Borrower shall make the proceeds of the Loan available to GZARG upon terms and conditions satisfactory to ADB. Except as ADB may otherwise agree, the terms for making the proceeds of the Loan available to GZARG shall include (i) commitment charge and interest at the rates identical to those applied to the Loan, (ii) a repayment period including a grace period identical to that applied to the Loan, and (iii) GZARG bearing the foreign exchange and interest rate variation risks.	Section 3.01 (a)	Complied with.
The Borrower shall cause the proceeds of the Loan to be made available through GZARG to the WMG upon terms and conditions satisfactory to ADB. Except as ADB may otherwise agree, the terms for making the proceeds of the Loan available to the WMG shall include (i) commitment charge and interest at the rates identical to those applied to the Loan; (ii) a repayment period, including a grace period identical to those applied to the Loan; and (iii) the WMG bearing the foreign exchange and interest rate variation risks.	Section 3.01 (b)	Complied with.
The Borrower shall cause GZARG and the WMG to apply the proceeds of the Loan to the financing of expenditures on the project in accordance with the provisions of this Loan Agreement and the Project Agreement.	Section 3.01 (c)	Complied with.
The Goods, Works, and consulting services and other items of expenditure to be financed out of the proceeds of the Loan and the allocation of amounts of the Loan among different categories of such Goods, Works, and consulting services and other items of expenditure shall be in accordance with the provisions of Schedule 3 to this Loan Agreement, as such Schedule may be amended from time to time by agreement between the Borrower and ADB.	Section 3.02	Complied with.
Except as ADB may otherwise agree, all Goods, Works, and consulting services to be financed out of the proceeds of the Loan shall be procured in accordance with the provisions of Schedule 4 to this Loan Agreement. ADB may refuse to finance a	Section 3.03	Complied with.
contract where Goods, Works, or consulting or services have not been procured under procedures		

Covenant	Reference in Loan and Project Agreements	Status of Compliance
substantially in accordance with those agreed between the Borrower and ADB or where the terms and conditions of the contract are not satisfactory to ADB.		
Except as ADB may otherwise agree, the Borrower shall cause all Goods, Works, and consulting services financed out of the proceeds of the Loan to be used exclusively in the carrying out of the project.	Section 3.04	Complied with.
The closing date for withdrawals from the Loan Account for the purposes of Section 9.02 of the Loan Regulations shall be 31 December 2014 or such other date as may from time to time be agreed between the Borrower and ADB.	Section 3.05	The closing date was extended to 31 December 2016 through an agreement between the Borrower and ADB. Complied with the extended date.
The Borrower shall cause GZARG, and shall through GZARG cause the WMG, to carry out the Project with due diligence and efficiency and in conformity with sound administrative, financial, engineering, environmental, geohazard prevention, urban roads, and urban facility development practices.	Section 4.01 (a)	Complied with.
In the carrying out of the Project and operation of the Project facilities, the Borrower shall perform, or cause to be performed, all obligations set forth in Schedule 5 to this Loan Agreement and the Schedule to the Project Agreement.	Section 4.01 (b)	Complied with.
The Borrower shall cause to be made available to GZARG and through GZARG to the WMG, and cause through GZARG the WMG, to make available, promptly as needed, facilities, services and other resources which are required, in addition to the proceeds of the Loan, for the carrying out of the Project.	Section 4.02	Complied with.
The Borrower shall ensure that the activities of its departments and agencies with respect to the carrying out of the Project and operation of the Project facilities are conducted and coordinated in accordance with sound administrative policies and procedures.	Section 4.03	Complied with.
The Borrower shall, through GZARG, take all action, which shall be necessary on its part to enable the WMG to perform its obligations under the Project Agreement	Section 4.04	Complied with.

Covenant	Reference in Loan and Project Agreements	Status of Compliance
and shall not take or permit any action that would interfere with the performance of such obligations.		
A date ninety (90) days after the date of this Loan Agreement is specified for the effectiveness of the Loan Agreement for the purposes of Section 10.04 of the Loan Regulations.	Section 5.01	Complied with. Loan was declared effective on 30 July 2009.
Except as ADB may otherwise agree, the Loan proceeds for financing Goods, Works, and consulting services and other items shall be disbursed in accordance with ADB's " <i>Loan Disbursement Handbook</i> " dated January 2007 (ADB's <i>Loan Disbursement Handbook</i>), as amended from time to time.	Schedule 3 (5)	Complied with.
Except as ADB may otherwise agree, the Borrower shall establish immediately after the Effective Date, an imprest account at a bank acceptable to ADB. The imprest account shall be established, managed, replenished and liquidated in accordance with ADB's <i>Loan Disbursement Handbook</i> , and detailed arrangements agreed upon between the Borrower and ADB. The currency of the imprest account shall be dollars. The initial amount to be deposited into the imprest account shall not exceed the lower of (i) the estimated expenditure for the first six (6) months of Project implementation, or (ii) the equivalent of ten (10) percent of the Loan amount.	Schedule 3 (6) (a)	Complied with. Initial advance of \$5 million was paid to the imprest account in November 2009.
The statement of expenditures procedure may be used for reimbursement of eligible expenditures not exceeding \$200,000 per individual payment, in accordance with ADB's <i>Loan Disbursement Handbook</i> and detailed arrangements agreed upon between the Borrower and ADB.	Schedule 3 (6) (b)	Complied with.
All Goods, Works, and consulting services to be financed out of the proceeds of the Loan shall be subject to and governed by the Procurement Guidelines, and the Consulting Guidelines, respectively.	Schedule 4 (1)	Complied with.
All terms used and not otherwise defined in this Loan Agreement have the meanings provided in the Procurement Guidelines and/or the Consulting Guidelines, as applicable.	Schedule 4 (2)	Complied with.

Covenant	Reference in Loan and Project Agreements	Status of Compliance
Except as ADB may otherwise agree, Goods and Works shall only be procured on the basis of the methods of procurement set forth below:	Schedule 4 (3)	Complied with.
<ul style="list-style-type: none"> International Competitive Bidding National Competitive Bidding Shopping 		
<p>The methods of procurement are subject to, among other things, the detailed arrangements and threshold values set forth in the Procurement Plan. The Borrower may only modify the methods of procurement or threshold values with the prior agreement of ADB, and modifications must be set out in updates to the Procurement Plan.</p>		
<p><u>Domestic Preference.</u> The Borrower may grant a margin of preference in the evaluation of bids under international competitive bidding in accordance with paragraphs 2.55(a) and 2.56 of the Procurement Guidelines for domestically manufactured Goods.</p>	Schedule 4 (4)	Complied with.
<p><u>National Competitive Bidding.</u> The Borrower and ADB shall ensure that, prior to the commencement of any procurement activity under national competitive bidding, the Borrower's national competitive bidding procedures are consistent with the Procurement Guidelines. Any modifications or clarifications to such procedures agreed between the Borrower and ADB shall be set out in the Procurement Plan. Any subsequent change to the agreed modifications and clarifications shall become effective only after written approval of such change by the Borrower and ADB.</p>	Schedule 4 (5)	Complied with.
<p>The Borrower shall not award any Goods and Works contracts financed under the Loan until: the Borrower shall inform ADB that the Undertaking Agreement as provided for in paragraph 4 of Schedule 5 to this Loan Agreement and paragraph 4 of Schedule to the Project Agreement shall have been executed by and have become legally binding upon the WMG and Dongtai.</p>	Schedule 4 (6)	Complied with.
<p><u>Quality- and Cost-Based Selection.</u> Except as ADB may otherwise agree, and except as set forth in the paragraph below, the Borrower shall apply quality- and cost-based selection for selecting and engaging consulting services.</p>	Schedule 4 (7)	Complied with.
<p>The Borrower shall ensure that all Goods and Works procured (including without limitation all computer</p>	Schedule 4 (8) (a)	Complied with.

Covenant	Reference in Loan and Project Agreements	Status of Compliance
hardware, software and systems, whether separately procured or incorporated within other goods and services procured) do not violate or infringe any industrial property or intellectual property right or claim of any third party.		
The Borrower shall ensure that all contracts for the procurement of Goods and Works contain appropriate representations, warranties and, if appropriate, indemnities from the contractor or supplier with respect to the matters referred to in subparagraph (a) of this paragraph.	Schedule 4 (8) (b)	Complied with.
The Borrower shall ensure that all ADB-financed contracts with consultants contain appropriate representations, warranties and, if appropriate, indemnities from the consultants to ensure that the consulting services provided do not violate or infringe any industrial property or intellectual property right or claim of any third party.	Schedule 4 (9)	Complied with.
All contracts procured under international competitive bidding procedures and contracts for consulting services shall be subject to prior review by ADB, unless otherwise agreed between the Borrower and ADB and set forth in the Procurement Plan.	Schedule 4 (10)	Complied with.
The WMG shall be the executing agency for the project responsible for overall Project implementation.	Schedule 5 (1)	Complied with.
The project leading group (PLG), which has been established by the WMG and is chaired by the Executive Mayor of the WMG, shall provide policy and operation guidance for implementation of the Project, facilitate coordination between different departments and resolve any institutional issues that have impact on project implementation. PLG shall consist of members from Wuzhou Development and Reform Commission, Wuzhou Municipal Housing and Urban and Rural Construction Commission and Wuzhou Finance Bureau.	Schedule 5 (2)	Complied with.
The PMO of Wuzhou municipal development project is established subordinated to PLG, and has office in Wuzhou Development and Reform Commission in order to complete day-to-day work. The PMO is responsible for reporting to the WMG, coordinating and supervising works of each implementation agency.	Schedule 5 (3)	Complied with.

Covenant	Reference in Loan and Project Agreements	Status of Compliance
The Borrower shall cause, through GZARG, the WMG, and Dongtai to enter into an undertaking agreement, in which Dongtai shall be designated as the implementing agency for the project responsible for day-to-day implementation of the project, including procurement of Goods and Works. The Undertaking Agreement shall, among others, include the obligations and requirements that the implementing agency shall undertake as provided in this Loan Agreement and the Project Agreement.	Schedule 5 (4)	Complied with.
GZARG, the WMG, and Dongtai shall ensure that all the project implementation procedures agreed upon with ADB be followed accordingly, including the environmental and social safeguards requirements.	Schedule 5 (5)	Complied with.
The Borrower shall cause GZARG and the WMG to ensure that in the event that (a) any change in ownership of Dongtai, or (b) any sale or transfer of assets, or assignment of the responsibilities of Dongtai under the Project is anticipated, ADB be duly informed and consulted with at least six (6) months prior to the anticipated change, or sale, transfer, or assignment.	Schedule 5 (6)	Complied with.
The Borrower shall cause GZARG, the WMG, and Dongtai to ensure that no material organizational changes (either financial, operational, or structural) to, nor material asset transfers to or from Dongtai be formally approved or implemented without the prior consultation with ADB, if such changes may affect Dongtai's ability to perform its obligations under the Undertaking Agreement. GZARG, the WMG, and Dongtai shall ensure that any such change be made in a lawful and transparent manner through duly certified decision or resolution specified under relevant laws of the Borrower.	Schedule 5 (7)	Complied with.
The Borrower shall cause GZARG, and cause through GZARG the WMG, to ensure (a) timely provision of counterpart financing necessary for the Project and provision of additional counterpart funding for any shortfall of funds or cost overrun, and (b) adequate funding for operation and maintenance of the Project facilities.	Schedule 5 (8)	Complied with.
The Borrower, GZARG, the WMG, and ADB shall, after the second year of Project implementation, jointly undertake a comprehensive midterm review of the Project. The midterm review shall include a detailed evaluation of the scope, implementation arrangement,	Schedule 5 (9)	Complied with. Midterm review mission fielded 30 August to 5 September 2011.

Covenant	Reference in Loan and Project Agreements	Status of Compliance
resettlement, achievement of scheduled performance targets, and progress on capacity development measures.		
Project Agreement		
GZARG, the WMG, and Dongtai shall carry out the project with due diligence and efficiency, and in conformity with sound administrative, financial, engineering, environmental, geohazard prevention, urban roads, and urban facility development practices.	Section 2.01 (a)	Complied with.
In the carrying out of the Project and operation of the project facilities, GZARG, the WMG, and Dongtai shall perform all obligations set forth in the Loan Agreement to the extent that they are applicable to GZARG, the WMG and Dongtai and all obligations set forth in the Schedule to this Project Agreement. In addition, the WMG shall ensure that the obligations or responsibilities attributed to, or specified to be undertaken by Dongtai, are duly performed or undertaken by Dongtai as specified in this Project Agreement.	Section 2.01 (b)	Complied with.
GZARG, WMG, and Dongtai shall make available, promptly as needed, the funds, facilities, services, equipment, land and other resources that are required, in addition to the proceeds of the Loan, for the carrying out of the project.	Section 2.02	Complied with.
In the carrying out of the Project, GZARG, the WMG, and Dongtai shall employ competent and qualified consultants and contractors, acceptable to ADB, to an extent and upon terms and conditions satisfactory to ADB.	Section 2.03 (a)	Complied with.
Except as ADB may otherwise agree, all Goods, Works, and consulting services to be financed out of the proceeds of the Loan shall be procured in accordance with the provisions of Schedule 4 to the Loan Agreement. ADB may refuse to finance a contract where Goods, Works, or consulting services have not been procured under procedures substantially in accordance with those agreed between the Borrower and ADB or where the terms and conditions of the contract are not satisfactory to ADB.	Section 2.03 (b)	Complied with.
GZARG, the WMG, and Dongtai shall carry out the project in accordance with plans, design standards, specifications, work schedules and construction	Section 2.04	Complied with.

Covenant	Reference in Loan and Project Agreements	Status of Compliance
methods acceptable to ADB. The WMG and Dongtai shall furnish, or cause to be furnished, to ADB and GZARG, promptly after their preparation, such plans, design standards, specifications and work schedules, and any material modifications subsequently made therein, in such detail as ADB shall reasonably request.		
Dongtai shall take out and maintain with responsible insurers, or make other arrangements satisfactory to ADB for, insurance of the Project facility to such extent and against such risks and in such amounts as shall be consistent with sound practice.	Section 2.05 (a)	Complied with.
Without limiting the generality of the foregoing, Dongtai undertakes to insure, or cause to be insured, the Goods to be imported for the project and to be financed out of the proceeds of the Loan against hazards incident to the acquisition, transportation and delivery thereof to the place of use or installation, and for such insurance any indemnity shall be payable in a currency freely usable to replace or repair such Goods.	Section 2.05 (b)	Complied with.
GZARG, the WMG, and Dongtai shall maintain, or cause to be maintained, records and accounts adequate to identify the Goods, Works, and consulting services and other items of expenditure financed out of the proceeds of the Loan, to disclose the use thereof in the project, to record the progress of the project (including the cost thereof) and to reflect, in accordance with consistently maintained sound accounting principles, its operations and financial condition.	Section 2.06	Complied with.
ADB on the one side and GZARG, the WMG, and Dongtai on the other side shall cooperate fully to ensure that the purposes of the Loan will be accomplished.	Section 2.07 (a)	Complied with.
GZARG, the WMG, and Dongtai shall promptly inform ADB of any condition which interferes with, or threatens to interfere with, the progress of the Project, the performance of its obligations under this Project Agreement or the accomplishment of the purposes of the Loan.	Section 2.07 (b)	Complied with.
ADB on the one side and GZARG, the WMG, and Dongtai on the other side shall from time to time, at the request of either party, exchange views through their representatives with regard to any matters relating to	Section 2.07 (c)	Complied with.

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the project, GZARG, the WMG, and Dongtai and the Loan.		
The WMG and Dongtai shall furnish to ADB all such reports and information as ADB shall reasonably request concerning (i) the Loan and the expenditure of the proceeds thereof; (ii) the Goods, Works, and consulting services and other items of expenditure financed out of such proceeds; (iii) the project; (iv) the administration, operations and financial condition of Dongtai; and (v) any other matters relating to the purposes of the Loan.	Section 2.08 (a)	Complied with.
Without limiting the generality of the foregoing, the WMG and Dongtai shall furnish to ADB quarterly reports on the execution of the project and on the operation and management of the project facilities. Such reports shall be submitted in such form and in such detail and within such a period as ADB shall reasonably request, and shall indicate, among other things, progress made and problems encountered during the quarter under review, steps taken or proposed to be taken to remedy these problems, and proposed program of activities and expected progress during the following quarter.	Section 2.08 (b)	Complied with. Progress reports were submitted in time.
Promptly after physical completion of the project, but in any event not later than three (3) months thereafter or such later date as ADB may agree for this purpose, the WMG and Dongtai shall prepare and furnish to ADB a report, in such form and in such detail as ADB shall reasonably request, on the execution and initial operation of the project, including its cost, the performance by the WMG and Dongtai of its obligations under this Project Agreement and the accomplishment of the purposes of the Loan.	Section 2.08 (c)	Complied with.
GZARG and the WMG shall, to the extent relevant to the Project, and Dongtai shall, (i) maintain separate accounts for the Project and for Dongtai's overall operations; (ii) have such accounts and related financial statements (balance sheet, statement of income and expenses, and related statements) audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB; and (iii) furnish to ADB, promptly after their preparation but in any event not later than six (6) months after the close of the fiscal year to which they relate, certified copies of such	Section 2.09 (a)	Complied with. Consolidated project financial statements were prepared annually. WMG submitted the audited accounts in English to ADB within 6 months of the end of each fiscal year.

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audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the Loan proceeds and compliance with the covenants of the Loan Agreement as well as on the use of the procedures for imprest account/statement of expenditures), all in the English language. The WMG and Dongtai shall furnish to ADB such further information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.		
GZARG and the WMG shall, to the extent relevant to the Project, and Dongtai shall enable ADB, upon ADB's request, to discuss Dongtai financial statements and its financial affairs from time to time with the auditors appointed by Dongtai pursuant to Section 2.09(a) here above, and shall authorize and require any representative of such auditors to participate in any such discussions requested by ADB, provided that any such discussion shall be conducted only in the presence of an authorized officer of Dongtai unless Dongtai shall otherwise agree.	Section 2.09 (b)	Complied with.
The WMG and Dongtai shall enable ADB's representatives to inspect the Project, the Goods and Works financed out of the proceeds of the Loan, all other plants, sites, properties and equipment of Dongtai, and any relevant records and documents.	Section 2.10	Complied with.
Dongtai shall, promptly as required, take all action within its powers to maintain its corporate existence, to carry on its operations, and to acquire, maintain and renew all rights, properties, powers, privileges and franchises which are necessary in the carrying out of the Project or in the conduct of its business.	Section 2.11 (a)	Complied with.
Dongtai shall at all times conduct its business in accordance with sound administrative, financial, environmental, geohazard prevention, urban roads, and urban facility development practices, and under the supervision of competent and experienced management and personnel.	Section 2.11 (b)	Complied with.
Dongtai shall at all times operate and maintain its plants, equipment and other property, and from time to time, promptly as needed, make all necessary repairs and renewals thereof, all in accordance with sound administrative, financial, engineering, environmental, geohazard prevention, urban roads, and urban facility	Section 2.11 (c)	Complied with.

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development, and maintenance and operational practices.		
Except as ADB may otherwise agree, Dongtai shall not sell, lease or otherwise dispose of any of its assets which shall be required for the efficient carrying on of its operations or the disposal of which may prejudice its ability to perform satisfactorily any of its obligations under this Project Agreement.	Section 2.12	Complied with.
Except as ADB may otherwise agree, Dongtai shall apply the proceeds of the Loan to the financing of expenditures on the project in accordance with the provisions of the Loan Agreement and this Project Agreement, and shall ensure that all Goods, Works, and consulting services financed out of such proceeds are used exclusively in the carrying out of the project.	Section 2.13	Complied with.
Except as ADB may otherwise agree, Dongtai shall duly perform all its obligations under the Undertaking Agreement, and shall not take, or concur in, any action which would have the effect of assigning, amending, abrogating or waiving any rights or obligations of the parties under the Undertaking Agreement.	Section 2.14	Complied with.
Dongtai shall promptly notify ADB of any proposal to amend, suspend or repeal any provision of its Charter and shall afford ADB an adequate opportunity to comment on such proposal prior to taking any action thereon.	Section 2.15	Complied with.
All the provisions of this Project Agreement shall continue in full force and effect notwithstanding any cancellation or suspension under the Loan Agreement.	Section 3.02	Complied with.
Any action required or permitted to be taken, and any documents required or permitted to be executed, under this Project Agreement by or on behalf of GZARG may be taken or executed by its Governor or by such other person or persons as the Governor shall so designate in writing notified to ADB; and any action required or permitted to be taken, and any documents required or permitted to be executed, under this Project Agreement by or on behalf of the WMG may be taken or executed by its Mayor or by such other person or persons as the Mayor shall so designate in writing notified to ADB.	Section 4.02 (a)	Complied with.
GZARG and the WMG shall furnish to ADB sufficient evidence of the authority of each person who will act under paragraph (a) of this Section, together with the	Section 4.02 (b)	Complied with.

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authenticated specimen signature of each such person.		
No delay in exercising, or omission to exercise, any right, power or remedy accruing to either party under this Project Agreement upon any default shall impair any such right, power or remedy or be construed to be a waiver thereof or an acquiescence in such default; nor shall the action of such party in respect of any default, or any acquiescence in any default, affect or impair any right, power or remedy of such party in respect of any other or subsequent default.	Section 4.03	Complied with.
The WMG shall be the executing agency for the project responsible for overall project implementation.	Schedule-1	Complied with.
The PLG, which has been established by the WMG and is chaired by the Executive Vice-Mayor of the WMG, shall provide policy and operational guidance for implementation of the Project. PLG shall consist of members from Wuzhou Development and Reform Commission, Wuzhou Finance Bureau, Wuzhou Municipal Development and Planning Commission, Wuzhou Land Resources Bureau, Wuzhou Environmental Protection Bureau, and Dongtai.	Schedule-2	Complied with.
The PMO established by the WMG under PLG shall provide day-to-day coordination and operation support for implementation of the Project, and engagement of consulting services.	Schedule -3	Complied with.
The WMG and Dongtai shall enter into an undertaking agreement, in which Dongtai shall be designated as the implementing agency for the project responsible for day-to-day implementation of the Project including procurement of Goods and Works. The Undertaking Agreement shall, among others, include the obligations and requirements that the implementing agency shall undertake as provided in the Loan Agreement and this Project Agreement.	Schedule -4	Complied with.
GZARG, the WMG, Dongtai shall ensure that all the project implementation procedures agreed upon with ADB be followed accordingly, including the environmental and social safeguards requirements.	Schedule -5	Complied with.
The WMG shall ensure that Dongtai be maintained as a separate legal entity under the relevant laws of the Borrower and be always managed through a sound financial management system satisfactory to ADB. The	Schedule-6	Complied with.

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WMG shall ensure that Dongtai has adequate operational funding resources to properly carry out all its duties as the implementing agency of the project, including payment of the salaries of the personnel, as they may be related to the project, and other operating costs		
GZARG and the WMG shall ensure that in the event that (i) any change in ownership of Dongtai, or (ii) any sale or transfer of assets, or assignment of the responsibilities of Dongtai under the project is anticipated, ADB be duly informed and consulted at least six (6) months prior to the anticipated change, or sale, transfer, or assignment.	Schedule-7	Not triggered.
GZARG, the WMG, and Dongtai shall ensure that no material organizational changes (either financial, operational, or structural) to, nor material asset transfers to or from Dongtai be formally approved or implemented without the prior consultation with ADB, if such changes may affect Dongtai's ability to perform its obligations under the Undertaking Agreement. GZARG, the WMG, and Dongtai shall ensure that any such change be made in a lawful and transparent manner through duly certified decision or resolution specified under relevant laws of the Borrower.	Schedule -8	Not triggered.
GZARG and the WMG shall ensure (i) timely provision of counterpart financing necessary for the Project and provision of additional counterpart funding for any shortfall of funds or cost overrun, and (ii) adequate funding for operation and maintenance of the project facilities.	Schedule -9	Complied with.
GZARG, the WMG, and Dongtai shall ensure that (i) all the Project facilities be designed and constructed in accordance with the relevant technical standards of the Borrower, (ii) construction supervision, quality control, and contract management be carried out in compliance with the relevant laws and regulations of the Borrower, and (iii) all the project facilities be operated and maintained in accordance with the relevant standards and regulations of the Borrower.	Schedule -10	Complied with.
With respect to part II of the project for the Hongling road network, GZARG shall cause the WMG to ensure (i) implementation of a program for the provision of road safety signage, communication, and traffic monitoring and hazard barriers; and (ii) implementation	Schedule -11	Complied with.

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of road safety measures in line with the laws and regulations of the Borrower on road transport safety.		
GZARG, the WMG, and Dongtai shall ensure that (i) the design and engineering treatment measures for geohazard prevention in Pingminchong valley will be carried out in strict conformity with scientific engineering norms and the standards and regulations of the Borrower specified for geohazard control and prevention works; (ii) this requirement will be explicitly specified in all the relevant engineering design and civil works contracts, particularly in the contracts for the Pingminchong geohazard prevention component; and (iii) the contractors' compliance with this requirement will be closely monitored by the project implementation consultant, and reported to ADB through the project progress reports.	Schedule-12	Complied with.
GZARG, the WMG, and Dongtai shall ensure that (i) a monitoring mechanism be established to closely observe the stability of the remaining buildings and underline land on the upper ridges of Pingminchong-Valley throughout project implementation until 2 years after project completion, (ii) the monitoring results be reported to ADB regularly through the Project progress reports, and (iii) immediate and adequate actions be undertaken in case of impaired stability in accordance with the established geohazard management procedures.	Schedule -13	Not triggered. As part of the integrated Pingminchong-Bingquanchong-Shiguchong geohazard prevention and resettlement program, all buildings on top of the hill and along the Pingminchong road were taken and demolished prior to construction at Pingminchong.
GZARG and the WMG shall ensure that (i) the geohazard forecasting and early warning system will be established and put into operation before the completion of part I of the project for Pingminchong Geohazard Prevention Component, and (ii) sufficient full time professional staff and financial resources be provided to support the operation and maintenance of the geohazard forecasting and early warning system to ensure its sustainable operation.	Schedule-14	Complied with.
The WMG shall actively examine and explore the possibility of establishing a revolving financing mechanism to support future geohazard mitigation projects in Wuzhou based on the results and	Schedule-15	Complied with.

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experiences gained through implementation of Part I of the project (Pingmingchong Geohazard Prevention).		
GZARG, the WMG, and Dongtai shall comply with ADB's Anticorruption Policy (1998, as amended from time to time). GZARG and the WMG agree (i) that ADB reserves the right to investigate any alleged corrupt, fraudulent, collusive, or coercive practices relating to the project; and (ii) to cooperate fully with, and to cause Dongtai to cooperate fully with, any such investigation and to extend all necessary assistance, including providing access to all relevant books and records, as may be necessary for the satisfactory completion of any such investigation.	Schedule -16	Complied with.
GZARG and the WMG shall (i) conduct periodic inspections on the contractors' activities related to fund withdrawals and settlements, and (ii) ensure that the Undertaking Agreement and all contracts financed by ADB in connection with the project include relevant provisions of ADB's Anticorruption Policy in all bidding documents for the project specifying the right of ADB to audit and examine the records and accounts of Dongtai and all the contractors, supplies, consultants, and other service providers as they relate to the project.	Schedule-17	Complied with.
GZARG and the WMG shall undertake the following anticorruption actions: (i) involve the agencies concerned with oversight responsibility for Dongtai in bidding and construction to enhance construction quality control and supervise effective work; (ii) introduce a dual signing system, in which the civil works contract winner signs an anticorruption contract with the employer when they execute the civil works contract; (iii) periodically inspect the contractor's activities related to fund withdrawals and settlements; (iv) engage the project management consultant to support the PMO and Dongtai to ensure good governance, accountability, and transparency in project operation; (v) in consultation with relevant central government ministries of the Borrower update rules and regulations on local and corporate governance and anticorruption and enhance transparency of Dongtai's operations; and (vi) disclose a summary of the financial statements and project accounts, and tracking of procurement contract awards on the official website of the WMG.	Schedule-18	Complied with.

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GZARG and the WMG shall ensure that (i) all land and right-of-way required by the project be made available in a timely manner; (ii) each resettlement plan be updated based on the final detailed design and detailed measurement surveys for the respective parts of the project; (iii) such updated resettlement plan be submitted to ADB for its concurrence prior to award of any related civil works contracts under the Project; and (iv) the approved resettlement plans be disclosed to project affected people in accordance with ADB's applicable information disclosure requirements for resettlement.	Schedule-19	Complied with.
GZARG and the WMG shall ensure that (i) each resettlement plan be implemented promptly and efficiently in accordance with their terms and in conformity with all the applicable laws and regulations of the Borrower, and ADB's Involuntary Resettlement Policy; (ii) all project affected persons be given adequate opportunity to participate in resettlement planning and implementation; (iii) counterpart funds for land acquisition and resettlement activities be timely provided; and (iv) any obligations in excess of the resettlement plans budget estimates be met.	Schedule -20	Complied with.
GZARG and the WMG shall ensure that (i) construction of the resettlement community in Zaochong be completed with sufficient quality housing facilities and functioning municipal infrastructures before relocating the households out of Pingminchong Valley and demolishing their current houses, (ii) the project-affected households be provided a replacement housing area equivalent to their current housing conditions in their original place, and (iii) cash option be provided for those families that may wish to settle in a community different from the resettlement community constructed under the project.	Schedule -21	Complied with.
GZARG and the WMG, through Dongtai, shall ensure that (i) adequate staff and resources be committed to supervising and internally monitoring the implementation of the resettlement plans for each part under the project during project implementation; (ii) ADB be provided with regular monitoring report on resettlement during implementation of resettlement plans through project progress reports, and a resettlement completion report for each Part; (iii) an independent agency acceptable to ADB be contracted to carry out monitoring and evaluation of implementation of resettlement plans during project	Schedule -22	Complied with. There was a well-organized institutional structure for the management and implementation of the resettlement work. An external resettlement monitoring agency (Wuzhou College)

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implementation, including collection of data disaggregated by gender where applicable, and forward external monitoring reports to ADB semi-annually and evaluate the results through annual survey updates for two (2) years after completion of the resettlement activities; (iv) ADB be promptly advised of any substantial changes in the resettlement impacts and, if necessary, a revised resettlement plan be submitted to ADB for approval; (v) works contracts under the project include the requirements to comply with the resettlement plans and entitlements for permanent and temporary impacts to affected persons; and (vi) the contractors be supervised to ensure compliance with requirements of the resettlement plans, applicable laws and regulations of the Borrower, and ADB's Involuntary Resettlement Policy.		from January 2011 to December 2016. Fourteen semiannual resettlement monitoring and evaluation reports were timely submitted by the consultants to the PMO and ADB
GZARG, the WMG, and Dongtai shall ensure that all the project facilities under the Project be constructed, operated, maintained, and monitored in strict conformity with (i) the environmental laws and regulations, policies, procedures and guidelines of the Borrower, including national and local regulations and standards for environmental protection, health, labor, occupation safety, and geohazard prevention and management; (ii) ADB's Environment Policy (2002) and related operational procedures; and (iii) the environmental mitigation and monitoring measures detailed in the approved EIAs, SEIA, and EMP.	Schedule -23	Complied with.
GZARG, the WMG, and Dongtai shall ensure that (i) any adverse environmental impacts arising from the project be minimized by implementing the mitigations measures recommended in the EIAs, SEIA, and EMP; (ii) justifications be provided for any proposed major changes to such mitigation measures required during the detailed design, construction, and operation and maintenance of the project facilities; and (iii) the civil work contracts under the project include obligations of the contractors for environmental protection, including relevant mitigation and monitoring measures specified in the EIAs, SEIA, and EMP.	Schedule -24	Complied with.
GZARG, the WMG, and Dongtai shall ensure that all the sludge, dredged materials, and solid waste generated in the course of implementation of the project be disposed of in accordance with the Borrower's national and local laws and regulations, and	Schedule -25	Complied with.

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that such disposal will create no risk of secondary pollution.		
GZARG, the WMG, and Dongtai shall ensure that (i) adequate personnel and sufficient resources will be provided to monitor the implementation of the EMP under the guidance of Wuzhou Environmental Protection Bureau, and (ii) semiannual environmental monitoring reports be provided to PMO for submission to ADB in form and substance acceptable to ADB. Such reports shall be provided to ADB from the commencement of project implementation until the project completion and include (i) progress made on mitigation measures and monitoring; (ii) restoration, condition, and return of land temporarily acquired during construction; (iii) problems encountered; and (iv) a corrective action plan in the event of any violation of the Borrower's environmental standards, rules, regulations or laws has occurred.	Schedule -26	Complied with. The environmental monitoring program included internal and external monitoring. Thirteen environmental monitoring reports were submitted to ADB.
The WMG and Dongtai shall ensure that the works contractors (i) provide timely payment of wages and safe working conditions to all workers including male and female workers with such requirements being included in Works contract and monitored by project implementation consultants; (ii) provide women's employment, where appropriate, and pay equal wages to the women and male employees for equivalent of equal value; and (iii) not employ child labor as required by the relevant laws and regulations of the Borrower.	Schedule -27	Complied with.
The WMG and Dongtai shall ensure that (i) construction and operational health and safety measures be incorporated into the design and bidding documents, and (ii) health and safety information including early warning notice for geohazard attacks be disseminated to contractors who will in turn disseminate such information to those employed during implementation of the project and/or for operation of the project facilities. Such measures shall, at a minimum, be sufficient to comply with the laws and regulations of the Borrower, and shall also be designed to provide a safe work environment.	Schedule -28	Complied with.
The WMG and Dongtai shall ensure that (i) priority in employment opportunities be given to the vulnerable groups including the women, the poor, and ethnic minorities who meet the job requirements for construction and maintenance activities; and that the contractors will provide the workers with adequate on-	Schedule -29	Complied with.

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<p>the-job training, use local unskilled labor and not differentiate wages based on gender; and (ii) all necessary steps be taken to encourage women living in the project area to participate in the planning and implementation of the project, including causing the contractors to maximize employment of women and monitor the project's effects on women during project implementation.</p>		
<p>GZARG, the WMG, and Dongtai shall coordinate with the responsible agencies to ensure (i) the contractors disseminate information on the risks of transmitting and contracting socially and sexually transmitted diseases including HIV/AIDS, to their employees during project implementation; and (ii) ensure that public environmental awareness and education programs be provided on health and hygiene behavior and properly managing wastewater and solid waste disposal.</p>	Schedule -30	Complied with.
<p>The WMG and Dongtai shall ensure that project performance and impact be monitored and evaluated through a PPMS, as agreed to by ADB, the WMG and Dongtai. At the beginning of the Project implementation, with support of the Project implementation consultant, the WMG shall develop the PPMS procedures to generate data systematically on the inputs and outputs of the different parts of the project, as well as the agreed performance indicators on outcome and impact of the project. The WMG, through the PMO, shall (i) refine the PPMS framework, (ii) confirm achievable targets, (iii) firm up monitoring and recording arrangement, and (iv) establish systems and procedures no later than six (6) months after loan effectiveness. The PPMS shall be designed to permit adequate flexibility to adopt remedial action for project design, schedule, activities, and development impacts.</p>	Schedule-31	Complied with.
<p>The WMG shall regularly report the baseline and progress data under the PPMS framework at the prescribed intervals. The WMG shall ensure that the PMO be responsible for analyzing and consolidating the data through its management system to be established for project implementation. The WMG shall ensure that the PMO, with assistance of project implementation consultants, monitor and assess activities, and report to ADB through the project progress reports on project implementation including physical implementation and financial aspects of the project from commencement until 2 years after project completion, to ensure that project impacts are</p>	Schedule -32	Complied with.

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monitored and reported in line with ADB requirements.		
ADB, GZARG, and the WMG shall, after the second year of project implementation, jointly undertake a comprehensive midterm review of the project. The midterm review shall include a detailed evaluation of the scope, implementation arrangement, resettlement, achievement of scheduled performance targets, and progress on capacity development measures.	Schedule -33	Complied with. The midterm loan review mission was conducted between 30 August and 5 September 2011.

ADB = Asian Development Bank, EIA = environmental impact assessment, EMP = environmental management plan, GZARG = Guangxi Zhuang Autonomous Region Government, PMO = project management office, PPMS = project performance monitoring system, SEIA = summary environmental impact assessment, WMG = Wuzhou Municipal Government.

Source: Asian Development Bank.

SUMMARY OF CONTRACTS

No.	PCSS No.	Contract No. (Subproject)	Contract Description	Category / % ADB Financing	Amount of Contract Award (CNY)	Revised Amount (CNY)	Contractor
1	0001	CB02: Pingminchong Valley geohazard resettlement and prevention	Civil works for Road No. 2 in the Zaochong resettlement community	01B/01D/100%	58,851,848.00	-	Wuzhou Municipal Engineering Management Department
2	0002	CA01: Pingminchong Valley geohazard resettlement and prevention	Roads, sewer pipes, retaining walls, slope protection, landscaping, and earth works for the Zaochong resettlement community	01A/01C/100%	28,433,445.00	48,803,445.00	Wuzhou First Construction and Installation Engineering Co. Ltd.
3	0003	CS01: Project management, capacity building and implementation support consulting services	Geohazard early warning and forecasting system development, capacity building, project management, and implementation	03/100%	\$2,000,000.00	\$2,399,960.00	NREM International Inc.
4	0004	CA02: Pingminchong Valley geohazard resettlement and prevention	Outdoor power distribution and supply, water supply, and fire hydrants for the Zaochong resettlement community	01A/01C/100%	12,437,124.47	14,863,118.56	JV of Guangxi Guichuan Construction Engineering Co. Ltd. and Guigang Fuyuan Electrical Investment Co. Ltd.
5	0005	CB01: Hongling road network and associated infrastructure	Civil works for Hongling Road No. 1	01B/01D/100%	110,935,257.90	129,613,807.52	China Railway 18th Bureau (Group) Co. Ltd.
6	0006	CB04: Hongling road network and associated infrastructure	Civil works for Hongling road nos. 9, 10, 12, and 13	01B/01D/100%	59,686,899.10	-	Jinhua Nuclear Industrial Construction Company
7	0007	CB03: Hongling road network and associated infrastructure	Civil works for Hongling road nos. 8, 11, 14, 15, 16, and 20	01B/01D/100%	52,086,211.94	-	The third construction engineering company of Guizhou
8	0008	CB08: Hongling road network and associated infrastructure	Civil works for Hongling road nos. 36 and 37	01B/01D/100%	104,744,822.17	129,170,000.00	Sichuan Da'an Construction Engineering Co. Ltd.

No.	PCSS No.	Contract No. (Subproject)	Contract Description	Category / % ADB Financing	Amount of Contract Award (CNY)	Revised Amount (CNY)	Contractor
9	0009	CA03: Pingminchong Valley geohazard resettlement and prevention	Geohazard rehabilitation for Pingminchong Valley	01A/01C/100%	43,784,610.91		Zhicheng Nuclear Industry Construction Company
10	0010	CB06: Hongling road network and associated infrastructure	Civil works for road nos. 3 (east) and 18	01B/01D/100%	57,530,933.74	61,030,175.85	Liuzhou Municipal Engineering Group Co. Ltd.
11	0011	CB09: Hongling road network and associated infrastructure	Landscaping for road nos. 1, 8, 15, 20, and 21	01B/01D/100%	11,469,410.23		Hainan Construction Gardening Engineering Co., Ltd.
12	0012	CB11: Hongling road network and associated infrastructure	Landscaping for road nos. 36 and 27	01B/01D/100%	14,925,426.26		Zhejiang Xintiandi Municipal Environment Landscape Co. Ltd.
13	0014	GB01: Hongling road network and associated infrastructure	Traffic control and lighting facilities for Hongling road nos. 1, 8–15, 18, 20, and 21	02/100%	12,662,324.82	13,393,984.30	Jiangsu Saiou Electric Co. Ltd.
14	0015	CB05: Hongling road network and associated infrastructure	Civil works for Hongling road nos. 17 and 19	01B/01D/100%	27,698,006.88	4,724,691.18	Hongyu Construction Group Co. Ltd.
15	0016	CB12: Hongling road network and associated infrastructure	Civil works Hongling Road No. 3 (west)	01B/01D/100%	60,963,136.58	10,453,695.17	Zhejiang Wanli Construction Engineering Co. Ltd.
16	0017	GB03: Hongling road network and associated infrastructure	Traffic control and lighting facilities for Hongling road nos. 36 and 37	02/100%	6,975,132.80	7,856,861.61	Guangxi Wuhong Construction Group Co., Ltd. and Zhongshan City Lanhe Photoelectric Lighting Technology Co., Ltd.
17	0018	CB07: Hongling road network and associated infrastructure	Drainage works for north side of Hongling Road No. 1	01B/01D/100%	10,497,255.33	5,686,125.48	Guilin Infrastructure Construction Co. Ltd.

ADB = Asian Development Bank, CNY = Chinese yuan, PCSS = procurement contract summary sheet.
Source: Asian Development Bank.

ECONOMIC REEVALUATION

A. Introduction

1. The economic analysis at appraisal considered the project an integral part of an ongoing urban development program rather than a stand-alone investment. The reevaluation of the project's economic internal rate of return (EIRR) confirmed its ability to deliver incremental improvements in urban services in Wuzhou. The analysis confirmed that Wuzhou's geohazard prevention and control were reasonable approaches to (i) the planning and regulatory development for sustainable urban development, and (iii) achieving mitigation measures to help communities in geohazard valleys cope with geohazard concerns. The analysis also showed that the project represented a least-cost approach to achieving incremental improvements in Wuzhou.

2. At completion, the EIRR of the project and individual outputs were reevaluated on a with-and without-project basis. The economic reevaluation is based on the updated scope compared with the project scope at appraisal. The EIRR is calculated separately for each of the two investment outputs under the project—the Pingminchong geohazard resettlement and prevention component and the Hongling road network and related infrastructure component—and for the project as a whole.

3. At appraisal, the Pingminchong output included (i) building a resettlement community in Zaichong—a geohazard-free urban area, to be equipped with quality housing and municipal infrastructure to accommodate about 6,823 people or 1,816 households to be evacuated from the geohazard-prone Pingminchong valley; and (ii) undertaking geohazard-control engineering measures to convert the evacuated Pingminchong valley into geohazard-free lands with a total area of about 20 hectares (ha) for urban redevelopment. The Hongling output entailed (i) building a comprehensive 36.2 kilometers urban road network together with related municipal infrastructure, including drainage pipelines, sewers, public green areas, lighting, and traffic management facilities; and (ii) promoting and facilitating the urban expansion into the geohazard-free Hongling—a new urban area of about 540 ha on the northern bank of Xunjiang between the newly constructed railway station and the fully developed urban area.

B. Economic Costs

4. The economic reevaluation is based on 2017 prices. The economic analysis was carried out using the world price numeraire. The economic costs were derived from the financial costs by deducting the taxes and duties. A shadow exchange rate factor of 1.013 has been used to convert border prices to domestic economic prices.¹ All the cost items are valued at domestic prices after the deduction of taxes and duties, except for (i) unskilled labor, (ii) fuel, and (iii) the capital cost of vehicles. Unskilled labor is valued at a shadow wage rate of 0.80 (i.e., 80% of the estimated wage rate on the project). A hurdle rate of 9% is adopted for the economic evaluation.

5. The economic costs for the Pingminchong component include (i) resettlement costs for the current households living in Pingminchong valley; and (ii) land leveling, treatment, and basic infrastructure installation costs. The economic costs for the Hongling component include (i) construction costs including land acquisition and resettlement, and (ii) operational and maintenance costs.

¹ The shadow exchange rate factor is based on values used in other recently approved similar projects in the People's Republic of China.

C. Demand Analysis

6. Based on estimates provided, there were an estimated 65,474 vehicles in the project roads of the Hongling area. The traffic counts and survey results were normalized through the application of seasonal factors to obtain annual average daily traffic based on peak and off-peak traffic conditions. Table 11.1 shows the traffic volume by type of vehicle during varying traffic conditions.

7. Considering the past growth patterns of gross domestic product (GDP), population growth, and real income per capita growth, traffic volume has been projected to increase from 65,474 in 2016 to 242,256 by 2033. The expected fleet composition is assumed to remain because of the improvement of road infrastructure under the project.

Table 11.1. Projected Traffic Volume of Vehicles, 2016–2033

Ref No.	Year	Projected Number of Vehicles per day (Normal + Generated)				Total
		Car	Bus	Light Truck	Heavy Truck	
1	2016	41,249	14,404	6,547	3,274	65,474
2	2017	44,549	15,557	7,071	3,536	70,713
3	2018	48,113	16,801	7,637	3,818	76,369
4	2019	51,962	18,145	8,248	4,124	82,479
5	2020	56,118	19,597	8,908	4,454	89,077
6	2021	60,608	21,165	9,620	4,810	96,203
7	2022	65,457	22,858	10,390	5,195	103,900
8	2023	70,693	24,686	11,221	5,611	112,211
9	2024	76,349	26,661	12,119	6,059	121,188
10	2025	82,456	28,794	13,088	6,544	130,882
11	2026	89,053	31,098	14,135	7,068	141,354
12	2027	96,177	33,586	15,266	7,633	152,662
13	2028	103,871	36,273	16,488	8,244	164,876
14	2029	112,181	39,174	17,807	8,903	178,065
15	2030	121,156	42,308	19,231	9,616	192,311
16	2031	130,848	45,693	20,770	10,385	207,696
17	2032	141,316	49,348	22,431	11,216	224,311
18	2033	152,621	53,296	24,226	12,113	242,256

Source: Asian Development Bank.

D. Economic Benefits

8. The project benefited urban residents in Wuzhou's city proper, particularly the Pingminchong and Hongling districts. The project's primary benefits included (i) improved avoidance of property damage and deaths caused by geohazards, and better housing conditions and quality of life for geohazard-threatened residents of Pingminchong valley; (ii) increased land values because of improvements in geological conditions and infrastructure; (iii) typical benefits arising from a road project such as time savings, fuel savings, vehicle operating cost savings, and accident cost reductions through the provision of municipal road infrastructure for the Hongling area; and (iv) faster GDP growth from improvements in general infrastructure. Moreover, the project supported the Wuzhou Municipal Government in promoting urban development and combating geohazards in an integrated, well-programmed, and cost-effective manner.

9. The project benefited from (i) the Pingminchong output with (a) the avoidance of property damage and loss of life because of people relocating out of the geohazard-prone valley, and the savings in the maintenance cost for slope protection and retaining walls; and (b) the increase in land values in Pingminchong because of the engineering treatment conducted under the project for geohazard prevention; and (ii) the Hongling road output with (a) time savings, fuel savings, vehicle operating cost savings, and accident cost reductions through the provision of a systematic road network for the Hongling area; (b) increased land values due to municipal infrastructure provided under the project; and (c) faster GDP growth because of the improvement in infrastructure. The key assumptions are described as follows:

- (i) Avoidance of property and loss of lives include benefits associated with cost savings on damages to properties and death of affected persons.
- (ii) Increase in land values resulting from resettlement, road improvement, and other municipal infrastructure led to economic benefits.
- (iii) Economic growth in these areas as indicated by GDP growth in Wuzhou.
- (iv) Accident cost savings include savings on medical and other costs.
- (v) Cost and time savings include time savings and vehicle operating cost savings from roads and drainage improvement.

Table 11.2. Benefits from Project Outputs

Component	Benefits	Damage	Parameters	Method Used
Pingminchong resettlement	Cost savings in property damage	Loss of property	Housing and land price	Statistics and/or studies
	Increased land values	Loss of lives, sickness		Loss of day's work, productivity loss
		Loss of income		Mortality data
	Economic benefits to the Wuzhou Municipal Government			Increase in property values
Hongling roads	Time and cost savings	Time lost		Time savings
				Vehicle operation costs savings
	Economic development Increased property values	Expenses incurred		Savings on costs related to accidents, vehicle maintenance, operations

Source: Asian Development Bank.

1. Hongling Road Network and Related Infrastructure

10. The economic benefits of the Hongling road network and related infrastructure output include time savings, fuel savings, savings on vehicle operating costs, and accident cost reductions through the provision of a systematic road network for the Hongling area. The Highway Cost Model, developed at the Massachusetts Institute of Technology in 1971,² is applied to estimate construction, maintenance and road user costs and subsequently their savings as a result of the Hongling road network component. The estimated benefits of accident cost savings, value of time savings, vehicle maintenance cost savings, and vehicle operating cost savings are shown in Table 11.3.

² Moavenzadeh, F., Berger, F., Brademeyer, B and Wyatt, R., 1975. *The Highway Cost Model: General Framework*. Department of Civil Engineering Research Report No. 75-4. Cambridge, MA: Massachusetts Institute of Technology.

Table 11.3. Benefit Calculation
(CNY million)

Year	Accident Cost Savings	Value of Time Savings	Vehicle Maintenance Cost Saving	Vehicle Operating Cost Saving	Total
2016	61	35.4	20.4	63.7	181
2017	68	39.4	22.0	68.8	198
2018	76	43.8	23.8	74.3	218
2019	84	48.7	25.7	80.2	239
2020	94	54.2	27.8	86.7	263
2021	104	60.3	30.0	93.6	288
2022	116	67.1	32.4	101.1	317
2023	129	74.6	35.0	109.2	348
2024	144	83.0	37.8	117.9	283
2025	160	92.3	40.8	127.3	420
2026	178	102.7	44.1	137.5	462
2027	198	114.2	47.6	148.5	508
2028	220	127.1	51.4	160.4	559
2029	245	141.4	55.5	173.2	615
2030	272	157.2	59.9	187.1	676
2031	303	174.9	64.7	202.1	745
2032	337	194.6	69.9	218.2	820
2033	375	216.4	75.5	235.7	903

CNY = Chinese yuan.

Source: Asian Development Bank.

2. Pingminchong Geohazard Resettlement and Prevention

11. The economic benefits of the Pingminchong output include (i) avoided loss of human and property damage, and (ii) increased value because of improved infrastructure. The calculated total amount of the direct project benefit is CNY34.96 million in 2017 with an increasing rate of 5% from 2017 to 2021, 2% from 2021 to 2026, and 0 increase after 2026. The treated land in Pingminchong will be sold in 2017 with an expected income of CNY301.1 million and 2018 with an expected income of CNY451.6 million.

E. Economic Internal Rate of Return and Sensitivity Analysis

12. The EIRR calculation only takes into account the main benefits from the two investment components but includes all of the project-related costs. The recalculated EIRRs at completion are 22.3% for the Pingminchong Geohazard Resettlement and Prevention, 18.5% for the Hongling Road Network and Related Infrastructure, and 19.4% for the whole project, all of which are greater than the hurdle rate of 9%. The result of the sensitivity test shows that even under unfavorable scenarios (10% increase of capital cost, operations and maintenance cost, and 10% decrease of revenue, and 1 year delay), the EIRRs could be greater than the hurdle rate of 9% and, therefore, accepted as economically viable for the overall project as well as for the two outputs. Table 11.4 presents the results of the economic reevaluation and sensitivity tests. Tables 11.5–11.7 present the detailed EIRR calculations.

Table 11.4. Economic Internal Rate of Return and Sensitivity Test Results
(CNY million)

Project Output		Base Scenario	Investment cost +10%	O&M Cost +10%	Revenue -10%
Pingminchong	ENPV	198.8	181.4	198.6	161.3
	EIRR	22.3%	20.9%	22.3%	20.8%
Hongling		ENPV	521.3	471.8	518.2
					416.6

Project Output		Base Scenario	Investment cost +10%	O&M Cost +10%	Revenue -10%
Whole Project	EIRR	18.5%	17.6%	18.5%	17.5%
	ENPV	720.1	653.2	716.8	577.9
	EIRR	19.4%	18.4%	19.4%	18.2%

EIRR = economic internal rate of return, ENPV = expected net present value, O&M = operation and maintenance.
Source: Asian Development Bank.

Table 11.5. Economic Internal Rate of Return and Sensitivity Analysis of Pingmingchong Output
(CNY million)

No.	Items	Total	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2033	EIRR	ENPV
1	Cash inflow	1,453.09									336.05	488.34	38.55	40.48	46.93		
1.1	Direct benefits	700.39									34.967	36.716	38.6	40.5	46.9		
1.2	Incomes of the treated land sold										301.1	451.6					
2	Cash outflow	244.30	111.50	21.41	23.27	31.06	12.42	9.07	0.49	21.80	0.61	0.63	0.66	0.68	1.14		
2.1	Investment cost	231.03	111.50	21.41	23.27	31.06	12.42	9.07	0.49	21.80							
2.2	Operating Cost	13.28									0.61	0.63	0.66	0.68	1.14		
3	Net cash flow	1,254.57	-11.50	-21.41	-23.27	-31.06	-12.42	-9.07	-0.49	-21.80	335.44	487.70	37.89	39.79	45.79	22.3%	198.8
4	Accumulated net cash flow		-11.50	-132.91	-156.18	-187.25	-199.66	-208.73	-209.22	-231.03	104.41	592.12	630.01	669.81	1,254.57		
Sensitivity tests	Investment cost +10%	1,185.68	-122.65	-23.55	-25.60	-34.17	-13.66	-9.98	-0.54	-23.98	335.44	487.70	37.89	39.79	45.79	20.9%	181.4
	O&M Cost +10%	1,207.46	-11.50	-21.41	-23.27	-31.06	-12.42	-9.07	-0.49	-21.80	335.38	487.64	37.83	39.73	45.67	22.3%	198.6
	Revenue -10%	1,063.48	-11.50	-21.41	-23.27	-31.06	-12.42	-9.07	-0.49	-21.80	301.83	438.87	34.04	35.75	41.09	20.8%	161.3
	Implementation delay 1 Year	1,162.96	-11.50	-21.41	-23.27	-31.06	-12.42	-9.07	-0.49	-21.80		335.44	487.70	37.89	45.83	19.7%	156.5

EIRR = economic internal rate of return, ENPV = expected net present value.

Source: Asian Development Bank.

Table 11.6. Economic Internal Rate of Return and Sensivity Analysis of Hongling Output
(CNY million)

No.	Items	Total	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2033	EIRR	ENPV
1	Cash inflow	7,056.37									198.34	217.69	238.98	262.41	902.24		
1.1	Direct benefits	7,056.37									198.34	217.69	238.98	262.41	902.24		
2	Cash outflow	935.39	40.09	259.54	131.04	34.87	112.75	47.01	16.00	103.82	5.76	5.93	6.11	27.48	9.24		
2.1	Investment cost	745.12	40.09	259.54	131.04	34.87	112.75	47.01	16.00	103.82							
2.2	Operating cost	190.27									5.76	5.93	6.11	27.48	9.24		
2.2.1	Annual maintenance	94.67									4.70	4.84	4.98	5.13	7.54		
2.2.2	Major maintenance	74.21												21.18			
2.2.3	Administrative fee	21.39									1.06	1.09	1.13	1.16	1.70		
3	Net cash flow	7,013.97	-40.09	-259.54	-131.04	-34.87	-112.75	-47.01	-16.00	-103.82	192.58	211.76	232.87	234.94	893.00	18.5%	521.3
4	Accumulated net cash flow		-40.09	-299.62	-430.66	-465.54	-578.29	-625.30	-641.30	-745.12	-552.54	-340.77	-107.90	127.04	7,013.97		
Sensitivity tests	Investment cost +10%	6,046.47	-44.10	-285.49	-144.14	-38.36	-124.03	-51.71	-17.60	-114.20	192.58	211.76	232.87	234.94	893.00	17.6%	471.8
	O&M Cost +10%	6,101.95	-40.09	-259.54	-131.04	-34.87	-112.75	-47.01	-16.00	-103.82	192.01	211.17	232.26	232.19	892.07	18.5%	518.2

No.	Items	Total	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2033	EIRR	ENPV
	Revenue -10%	5,415.34	-40.09	-259.54	-131.04	-34.87	-112.75	-47.01	-16.00	-103.82	172.75	189.99	208.98	208.70	802.77	17.5%	416.6
	Implementation delay 1 Year	5,310.49	-40.09	-259.54	-131.04	-34.87	-112.75	-47.01	-16.00	-103.82		192.58	211.76	232.87	810.49	16.7%	365.5

EIRR = economic internal rate of return, ENPV = expected net present value.

Source: Asian Development Bank.

Table 11.7. Economic Internal Rate of Return and Sensitivity Analysis of the Whole Project
(CNY million)

No.	Items	Total	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2033	EIRR	ENPV
1	Cash inflow	8,509.46									534.39	706.03	277.53	302.89	949.16		
1.1	Direct benefits of Pingminchong	700.39									35	37	39	40	47		
1.2	Sales income of Pingminchong	752.70									301	452					
1.3	Direct benefits of Hongling	7,056.37									198	218	239	262	902		
2	Cash outflow	1,179.69	151.59	280.95	154.31	65.93	125.17	56.08	16.49	125.62	6.37	6.56	6.77	28.16	10.38		
2.1	Investment cost	976.14	151.59	280.95	154.31	65.93	125.17	56.08	16.49	125.62							
2.2	Operating cost	203.55									6.37	6.56	6.77	28.16	10.38		
2.2.1	Annual maintenance	94.67									4.70	4.84	4.98	5.13	7.54		
2.2.2	Major maintenance	74.21												21.18			
2.2.3	Administrative fee	34.67									1.67	1.73	1.78	1.84	2.84		
3	Net cash flow	8,268.55	-151.59	-280.95	-154.31	-65.93	-125.17	-56.08	-16.49	-125.62	528.02	699.46	270.77	274.73	938.78	19.4%	720.1
4	Accumulated net cash flow		-151.59	-432.54	-586.85	-652.78	-777.95	-834.03	-850.52	-976.14	-448.12	251.34	522.11	796.84	8,268.55		
Sensitivity tests	Investment cost +10%	7,232.15	-166.75	-309.04	-169.74	-72.53	-137.69	-61.69	-18.14	-138.19	528.02	699.46	270.77	274.73	938.78	18.4%	653.2
	O&M cost +10%	7,309.41	-151.59	-280.95	-154.31	-65.93	-125.17	-56.08	-16.49	-125.62	527.39	698.81	270.09	271.92	937.74	19.4%	716.8
	Revenue -10%	6,478.82	-151.59	-280.95	-154.31	-65.93	-125.17	-56.08	-16.49	-125.62	474.58	628.86	243.01	244.44	843.87	18.2%	577.9
	Implementation delay 1 Year	6,473.44	-151.59	-280.95	-154.31	-65.93	-125.17	-56.08	-16.49	-125.62		528.02	699.46	270.77	856.32	17.4%	522.0

EIRR = economic internal rate of return, ENPV = expected net present value, O&M = operation and maintenance.

Source: Asian Development Bank.

FINANCIAL REEVALUATION

A. Introduction

1. The Guangxi Wuzhou Urban Development Project does not have a revenue-generating component. Therefore, the financial analysis focused on assessing the financial impact and the management of the Wuzhou Municipal Government (WMG) and Wuzhou Dongtai State Assets Operations Corporation Ltd. (Dongtai), the implementing agency. Fiscal impact and affordability analyses were carried out by comparing financing sources with the annual funds required for operation and maintenance (O&M) and debt servicing during operation. Dongtai implemented the project on behalf of the WMG. The WMG is responsible for loan repayments and O&M, while Dongtai managed the construction of the project and then transferred the completed assets to the WMG for operation. Since Dongtai played the role of an agent to implement the project on behalf of the WMG, the project will have no impact on the financial status of the implementing agency.

2. A financial reevaluation of the project was conducted to determine financial sustainability, including assessing the fiscal capacity of the WMG after project completion. The financial reevaluation was conducted in accordance with the Asian Development Bank (ADB) *Guidelines for the Financial Management and Analysis of Projects*¹ and *Financial Due Diligence: A Methodology Note*.² The financial projections are based on updated information on the WMG and the ADB loan debt servicing and projected O&M costs. The fiscal impact analyses involved two project outputs: (i) the Pingminchong geohazard resettlement and prevention and (ii) the Hongling road network and related infrastructure.

B. Financial Sustainability

1. Past Financial Performance

3. Since the WMG is responsible for loan repayments and O&M, an assessment of its current financial position and its projected revenues and expenses has been undertaken to assess their ability to ensure project sustainability. The WMG has several sources of revenue, including taxes and charges, and transfers from the central government and the Guangxi Zhuang Autonomous Region Government (GZARG) in the form of budgetary support and/or project financing. Taxation (such as value added tax, business tax, income tax, resource tax, real property tax) represents the largest form of overall revenue generated by the municipality, but much of it is collected for the central government. Apart from the local share of taxation, the WMG has revenues from the state-owned enterprises and from the fees collected for municipal services, including education levies. Selling land is another important source of income.

4. The central government and/or GZARG have simultaneously invested in programs and projects for implementation by the WMG. These total inflows from the central government and GZARG, which are nearly as large as WMG's retained revenue, are an important source of finance, especially for development projects. Expenditures, however, are categorized into general public services, education, public safety, personnel welfare, environmental protection, agriculture, forestry and water, and transportation. Based on past data, the fiscal revenue and expenditure of the WMG grew from CNY5,133 million to CNY13,230 million, representing an annual average

¹ ADB. 2005. *Financial Management and Analysis of Projects*. Manila.

² ADB. 2009. *Financial Due Diligence: A Methodology Note*. Manila.

rate of 26.7% and 21.0% respectively, from 2011 to 2015. During the same period, the WMG had a surplus of revenues over expenditure averaging 17%, indicating its strong profitability position.

Table 12.1. Historical Revenue and Expenditure of Wuzhou Municipal Government
(CNY million)

Items	2011	2012	2013	2014	2015	Annual Average Growth Rate
Revenue	5,133	7,678	7,700	10,027	13,230	26.7%
Expenditure	4,509	6,640	6,838	8,676	9,674	21.0%
Surplus	625	1,037	863	1,352	3,556	54.5%
Surplus and/or revenue	12.2%	13.5%	11.2%	13.5%	26.9%	17.0%

CNY = Chinese yuan.

Source: Wuzhou Municipal Government.

2. Wuzhou Municipal Government Financial Projections

5. Financial forecasts for the WMG have been carried out based on assumptions that revenue and expenditure will increase at 5% after 2015 based on the national development plan of the People's Republic of China. As projected, the WMG is expected to exhibit strong financial growth until 2028.

Table 12.2. Revenue and Expenditure Projection of Wuzhou Municipal Government
(CNY million)

Items	2015	2016	2017	2018	2019	2020	2028
Growth rate		5%	5%	5%	5%	5%	5%
Revenue	13,230	13,892	14,586	15,315	16,081	16,885	24,947
Expenditure	9,674	10,158	10,666	11,199	11,759	12,347	18,242
Surplus	3,556	3,734	3,921	4,117	4,322	4,539	6,706
Surplus/revenue	26.9%	26.9%	26.9%	26.9%	26.9%	26.9%	26.9%

CNY = Chinese yuan.

Sources: Wuzhou Municipal Government and Asian Development Bank estimates.

3. Impact of Debt Repayment and Operation and Maintenance

6. Following the grace period on the ADB loan and domestic loans, the WMG is required to make payments to cover both principal and interest on the respective loans from 2014 onwards of CNY182.1 million, decreasing to CNY48.59 million by 2028. The percentages of annual debt service to revenues, expenditure, and surplus decrease from 1.82%, 2.10% and 13.48% in 2014 to 0.19%, 0.27% and 0.72% in 2028. Accordingly, the WMG should be able to meet the project's debt servicing requirements without placing undue pressure on its other expenditures.

Table 12.3. Fiscal Impact of Debt Repayments
(CNY million)

Items	2014	2015	2016	2017	2018	2019	2028
Annual debt service	182.14	178.99	172.97	166.86	174.72	168.25	48.59
Revenue	10,027	13,230	13,892	14,586	15,315	16,081	24,947
Percentage debt/revenue	1.82%	1.35%	1.25%	1.14%	1.14%	1.05%	0.19%
Expenditure	8,676	9,674	10,158	10,666	11,199	11,759	18,242

Items	2014	2015	2016	2017	2018	2019	2028
Percentage debt/expenditure	2.10%	1.85%	1.70%	1.56%	1.56%	1.43%	0.27%
Surplus	1,352	3,556	3,734	3,921	4,117	4,322	6,706
Percentage debt/surplus	13.48%	5.03%	4.63%	4.26%	4.24%	3.89%	0.72%

CNY = Chinese yuan.

Source: Asian Development Bank.

7. O&M costs include personnel salaries and welfare, maintenance costs, administration, insurance, and other expenses. The annual fund required for O&M is projected between CNY6.43 million and CNY8.99 million during the operating period. This represents 0.04%, 0.06%, and 0.16% of projected revenues, expenditure, and surplus of WMG in 2017; and 0.04%, 0.05%, and 0.13% in 2028.

Table 12.4. Fiscal Impact of Operations and Maintenance Payment
(CNY million)

Items	2017	2018	2019	2020	2021	2022	2028
Operations and maintenance	6.43	6.63	6.83	28.51	7.26	7.49	8.99
Revenue	14,586	15,315	16,081	16,885	17,730	18,616	24,947
Percentage	0.04	0.04	0.04	0.17	0.04	0.04	0.04
Expenditure	10,666	11,199	11,759	12,347	12,964	13,612	18,242
Percentage	0.06	0.06	0.06	0.23	0.06	0.06	0.05
Surplus	3,921	4,117	4,322	4,539	4,766	5,004	6,706
Percentage	0.16	0.16	0.16	0.63	0.15	0.15	0.13

CNY = Chinese yuan.

Source: Asian Development Bank.

8. The analysis indicates that debt servicing and O&M appear reasonable as a percentage of income expenditure and are not likely to affect WMG's other programs. This indicates an acceptable fiscal risk for the WMG, particularly because of the sustained increase in revenues of the WMG. Since Dongtai played the role of an agent to implement the project on behalf of the WMG, the project will have little impact on the financial status of the implementing agency. An assessment of the financial impact on the WMG and Dongtai confirmed that the project will not affect the future financial sustainability of either.

4. Revolving Fund

9. The potential of the revolving financing mechanism has been examined by comparing geohazard resettlement and prevention costs and the revenues that could be generated from the auction of redesigned lands. It is expected that the urban land values in Wuzhou will remain at current levels, and that the revenue from the sales of the treated and geohazard-free land would enable the WMG to fully recover the cost of geohazard resettlement and prevention. This could be used as seed money to establish the revolving fund for future geohazard-mitigation projects of other geohazard-prone valleys of the city.

FINANCIAL MANAGEMENT REASSESSMENT

A. Introduction

1. The Asian Development Bank (ADB) conducted a financial management assessment for the project in accordance with the ADB *Guidelines for the Financial Management and Analysis of Projects*¹ and *Financial Due Diligence: A Methodology Note*.² The financial management assessment considers the Wuzhou Municipal Government (WMG) in its role as the executing agency for the project, and the Wuzhou Dongtai State Assets Operations Corporation. (Dongtai) as the implementing agency. The financial management assessment includes a review of the accounting and reporting system, internal and external auditing arrangements, fund disbursement procedures, and information systems. The instrument used for the assessment was ADB's financial management assessment questionnaire.

2. The assessment, which was undertaken on the executing agency (Wuzhou Finance Bureau on behalf of the WMG) and the implementing agency (Dongtai), concluded that through adequate capacity building from this project, the financial management capacity of both the WMG and Dongtai has been adequate for the implementation and operation of the project. The Guangxi Zhuang Autonomous Region Government (GZARG) Finance Bureau has managed multiple ADB projects and the financial capacity to administer the imprest account.

B. Risk Analysis and Mitigation

3. A financial management internal control and risk management assessment was conducted as per ADB guidelines.³ The overall risk assessment in relation to the Wuzhou Finance Bureau was judged *low*, and the overall assessment in relation to Dongtai was also assessed *low*. Particular weaknesses regarding the current level of familiarization with financial management, project accounting policies, and the disbursement procedures of ADB have been adequately addressed through capacity building as part of the project management and capacity building component of the project.

4. At present, both the executing agency and implementing agency have adequate financial management capacity. No further risk mitigation is judged to be necessary for the operation of the project.

B. Disbursement

5. ADB loan proceeds were disbursed in accordance with the procedures set out in ADB's *Loan Disbursement Handbook* (2007, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.

6. Pursuant to ADB's *Safeguard Policy Statement* (2009), ADB funds were applied to the activities described on the ADB Prohibited Investment Activities List set forth in Appendix 5 of the *Safeguard Policy Statement*. All financial institutions have ensured that their investments were in compliance with applicable national laws and regulations, and applied the prohibited investment activities list (Appendix 5) to the components financed by ADB.

¹ ADB. 2005. *Financial Management and Analysis of Projects*. Manila.

² ADB. 2009. *Financial Due Diligence: A Methodology Note*. Manila.

³ ADB. 2005. *Financial Management and Analysis of Projects*. Manila. No financial management assessment was conducted for the Guangxi Zhuang Autonomous Region Finance Bureau, which has been successfully implementing other ADB projects.

7. The Guangxi Zhuang Autonomous Region Finance Department (GFD) established an imprest account at a commercial bank acceptable to ADB, promptly after loan effectiveness. The GFD has administered the imprest account properly. The imprest account was used exclusively for ADB's share of eligible expenditures. The GFD has fulfilled its accountability and responsibility for the proper use of advances to the imprest account. Supporting documents have been submitted to ADB or retained by the GFD in accordance with ADB's *Loan Disbursement Handbook* when liquidating or replenishing the imprest account.

8. As required, the borrower submitted to ADB sufficient evidence of the authority of the person(s) who signed the withdrawal applications on behalf of the borrower, together with the authenticated specimen signatures of each authorized person before the submission of the first withdrawal application. Withdrawal applications and supporting documents demonstrated, among other things, that the goods and/or services were produced in or from ADB members and were eligible for ADB financing.

C. Accounting

9. The WMG and Dongtai maintained separate project financial statements and records for all expenditures incurred on the project in accordance with financial reporting standards acceptable to ADB. The statements and records showed the sources of funds (from ADB, the government, and other cofinanciers). Consolidated project financial statements were prepared annually in accordance with applicable guidance and regulations, where these were generally consistent with internationally recognized accounting principles and practices.⁴

D. Auditing and Public Disclosure

10. An auditor acceptable to ADB audited the detailed consolidated project accounts in accordance with the *Guidelines for the Audit of ADB and World Bank-Financed Projects*⁵ and *International Standards on Auditing* and the auditing standards of the People's Republic of China (where these are consistent with the *International Standards on Auditing*). The WMG submitted the audited accounts to ADB in English within 6 months of the end of each fiscal year. The audit reports covered the following:

- (i) the annual consolidated project financial statements;
- (ii) an audit report including the auditor's opinions, which covered (a) whether the project financial statements presented a true and fair view or were presented fairly, in all material respects, in accordance with the applicable financial reporting framework; (b) whether or not loan and grant proceeds were used only for the purposes of the project; (c) the level of compliance for each financial covenant contained in the legal agreements for the project; (d) compliance with the imprest fund procedure; and (e) compliance with the use of the statement of expenditure (SOE) procedure certifying (1) to the eligibility of those expenditures claimed under SOE procedures, and (2) the proper use of the procedure in accordance with ADB's *Loan Disbursement Handbook*;
- (iii) the audit findings and recommendations; and
- (iv) the audited annual financial statements of Dongtai.

⁴ Applicable laws, regulations, and guidelines include (i) *Accounting Law of the PRC (2000)*, (ii) *State-Owned Construction Enterprise Accounting Control Regulations*, (iii) *Capital Construction Financial Control Regulations*, and (iv) *Accounting Methods for Projects Financed by the World Bank*.

⁵ China National Audit Office. 2012. *Guidelines for the Audit of Asian Development Bank and World Bank-Financed Projects*. Beijing.

11. Review missions monitored compliance with financial reporting and auditing requirements as well as normal program supervision, and followed up regularly with all concerned, including the external auditor.

ENVIRONMENTAL IMPACT ANALYSIS

A. Introduction

1. The Guangxi Wuzhou Urban Development Project consists of three subprojects. They cover the following:

- (i) **Pingminchong Valley geohazard resettlement and prevention.** The outputs include (a) the construction of a well-serviced resettlement community in Zaochong equipped with quality housing and municipal infrastructure; (b) 1,721 families and 24 enterprises (6,505 persons) relocated from the geohazard-prone Pingminchong Valley and properly resettled to the Zaochong resettlement community; and (c) geohazard-prone Pingminchong Valley is systematically and thoroughly treated with anti-geohazard engineering measures to become 19.27 hectares (ha) of landslide-free land for urban redevelopment.
- (ii) **Hongling road network and related infrastructures.** The output is the construction of 32.6 kilometers (km) of urban road with associated municipal infrastructure, including drainage and sewage pipelines in the geohazard-free new urban district.
- (iii) **Capacity building and project management.** The outputs include (a) a GIS-compatible geohazard forecasting and early warning system built and operational to cover 500 km² under the threat of geohazard in Wuzhou; (b) technical support, including relevant training in urban planning and geohazard management for the Wuzhou Municipal Government (WMG) and the project implementing agency to strengthen their capacity to meet the operational requirements of the project during implementation; and (c) specialized consulting services under this component to improve public awareness of geohazards and geohazard management through the existing community-based geohazard monitoring and warning system.

2. Certified environmental impact assessment (EIA) institutes prepared the domestic EIAs in accordance with relevant laws, regulations, and standards applicable in the People's Republic of China (PRC) and following the Asian Development Bank (ADB) *Environment Policy (2002)* and *Environmental Assessment Guidelines (2003)*. The relevant environmental administrative authorities approved all of the subproject EIAs. The project was classified *category A* for the environment during the technical assistance fact-finding mission.

B. Institutional Setup and Environmental Management

3. A summary of the environmental impact assessment, including the environmental management plan (EMP), was circulated to the ADB Board of Directors and posted on the ADB website on 14 August 2008. The EMP defined the roles and responsibilities of relevant institutions for environmental management, including the contractors, implementing agency, executing agency, municipal environmental protection bureau, municipal environmental monitoring station, ADB, and loan implementation consultants.

4. The WMG assigned one officer to coordinate and oversee the implementation of the EMP. The implementing agency assigned one manager and one officer in charge of environmental management. The environmental protection provisions were included in the procurement documents and awarded contracts, which can continuously improve environmental protection activities during preconstruction, construction, and operation to prevent, reduce, or mitigate adverse impacts. The implementing agency implemented environmental activities, including mitigation measures, environmental monitoring, information disclosure, public consultations, and

a grievance redress mechanism. The municipal environmental protection bureau conducted a project completion environmental audit for each subproject in accordance with the *PRC Management Guidelines on Project Completion Environmental Audit (2001)*. The environmental monitoring programs included internal and external monitoring. The contractors' on-site environmental engineers, implementation agency officers, and Wuzhou project management officers carried out internal monitoring through site inspections. The municipal environmental monitoring station carried out external monitoring under contracts to the implementing agency. The results of the internal and external monitoring showed that the contractors complied with the provisions of the EMP. Thirteen environmental monitoring reports were prepared and submitted to ADB from the start of loan implementation in July 2009 to the closure of the loan in December 2016. ADB reviewed all the reports and found them to be of acceptable quality. The reports were disclosed on the ADB website.¹ The loan implementation consultants provided training to the executing agency, implementing agency, and contractors on ADB environmental safeguard policy requirements, and international and national best practices on environmental management, and supported the executing agency and implementing agency in fulfilling the monitoring and reporting responsibilities.

C. Environmental Impacts and Mitigation Measures Undertaken

5. The mitigation measures proposed in the summary of the EIA and the domestic EIAs were well-implemented and ensured all subprojects' construction and operation complied with environmental requirements. During project component tendering—especially for civil works—environmental monitoring and the mitigation of impacts were the key evaluation criteria for bids, which were carefully reviewed and evaluated. Environmental monitoring and public consultations undertaken during project implementation and operation showed that the implementation of the mitigation measures adopted was effective and the residual environmental impacts were controlled and reduced to insignificant levels.

a. Air Pollution

6. During construction, the residual air pollution from construction machinery was temporary and insignificant. Suspended particulates from excavation and transportation were well controlled by covering and spraying water on the transportation vehicles and exposed areas. Construction vehicles, machinery, and equipment were certified, and maintained and inspected regularly to ensure compliance with the applicable air emission standards. Exposed areas were revegetated immediately upon the completion of construction. During operation, air pollution mainly comes from vehicular air emissions from the Hongling road network. Vehicles travelling along the projects will be certified to meet national emission and safety standards. Traffic police will conduct regular and random on-spot inspections; violators will be fined and taken off the roads.

b. Noise

7. During construction, contractors used low-noise equipment and applied noise mitigation in sensitive locations in accordance with EMP requirements. Construction vehicles, machinery, and equipment were certified, and maintained and inspected regularly to ensure compliance with the applicable noise emission standards. During operation, noise comes mainly from road traffic. Vehicles travelling along the projects will be certified to meet national noise emission and safety standards. Traffic police will conduct regular and random on-spot inspections; violators will be

¹ Thirteen monitoring reports were submitted, and as of 30 August 2017, the first to 12th monitoring reports were disclosed while the 13th (final report) are under the final revision incorporating ADB's comments.

fined and taken off the roads. The Zaochong resettlement community has a safe distance to noise from road traffic. Since Hongling is a new urban district, existing and future developments are required to comply with national ambient noise standards for applicable land uses.

c. Wastewater

8. In the construction phase, septic tanks and on-site wastewater treatment devices were installed to collect and treat wastewater from management offices, equipment and machinery repair, and maintenance workshops before being discharged into the receiving water bodies. The municipal sewerage network services the Zaochong resettlement community. The rehabilitated Pingminchong Valley and project roads in the Hongling new urban district do not produce wastewater during the operation phase.

d. Solid Waste

9. During construction, spoils and borrows were optimized and balanced for all subprojects; no spoils needed disposal. For the Pingminchong geohazard resettlement and rehabilitation site, the surrounding hills were cut to fill the bottom of the valley for land leveling; the spoils were fully used. At the Zaochong resettlement community site, the spoils were fully used to prepare the land for construction of the resettlement housing. In the Hongling road network area, the landscape is characterized by rolling hills. The aerial development has been planned and executed such that the cut-and-fill was balanced without the need for borrow and disposal. Equipment packaging was collected and transported to waste recycling stations. Solid wastes from the construction camps were collected and transported to the nearest solid waste transfer stations and municipal sanitary landfill. The Zaochong resettlement community is served by municipal garbage collection services. Garbage from road cleaning is transported to the municipal sanitary landfill.

e. Revegetation

10. During the construction phase, all exposed surfaces were immediately revegetated upon completion of construction. The compound's landscaping service division maintains the green spaces at the Zaochong resettlement community. Dongtai maintains the vegetation at the rehabilitated Pingminchong Valley. The Wuzhou municipal landscape bureau maintains the green spaces in the Hongling new urban district.

f. Health and Safety

11. During construction, contractors complied with the national regulatory requirements for the health and safety of construction workers and local communities. Construction workers wore protective equipment and suits while working on site. Those operating special equipment and machinery were trained and licensed. Regular health checks were provided to the workers. Construction workers were trained on community safety. Construction sites were properly fenced to protect local communities. Signs were posted along construction routes to warn the local residents about construction hazards. Safety personnel were placed in busy spots during rush hours. No major construction accidents occurred at the project sites during construction.

D. Project Completion Environmental Audit

12. The external environment monitoring consultant carried out project completion environmental audits, and the Wuzhou municipal environmental protection bureau reviewed

them, in accordance with the *PRC Management Guidelines on Project Completion Environmental Audit (2001)*.² All the subprojects that completed an environmental audit passed the audit.

E. Environmental and Social Benefits

13. The project has generated multiple environmental and social benefits. Improved road conditions will reduce the use of fuel and air emissions. Modern municipal infrastructure and services in the Zaichong resettlement community have improved environmental sanitation for the 6,505 relocated residents, including sanitary infrastructure and services in the Pingminchong Valley such as water supply, sewerage, solid waste, and roads.

14. The social benefits include the resettlement of the geohazard-threatened 6,505 people in the Pingminchong Valley to the geohazard-free Zaichong resettlement community, and the incremental supply of safe land for urban development at the rehabilitated Pingminchong Valley. The Hongling road network subproject will serve a total area of 540 ha and a population of 100,000 for future urban growth until 2033.³ This hazard-free land will allow the WMG to move people from other geohazard-prone areas to safer communities, and facilitate urban expansion into geohazard-free land. The Hongling road network will support the WMG's strategy of geohazard management and sustainable urban development, in addition to other economic development benefits. More importantly, the WMG has piloted a model for geohazard prevention that has been replicated in the adjacent geohazard-prone Shiguchong Valley and Bingchuanchong Valley, where people have already been resettled in the geohazard-free Zaichong resettlement community and sites rehabilitated in the Pingminchong Valley. The geohazard early warning and forecasting system has benefited more than 808,500 people throughout the Wuzhou Municipality. This innovative approach to geohazard management and mitigation will be easy to demonstrate, providing opportunities for it to be replicated in Wuzhou, throughout the PRC, and other parts of Asia.

F. Public Consultation and Grievance Redress

15. Annual public consultations were also undertaken to get feedback from the local community regarding the environmental impacts and effectiveness of mitigation measures contained in the EMP. Consultations indicated that local community members did not experience undue environmental impacts, and the general public was pleased with the environmental and social benefits. A grievance redress mechanism was established whereby the implementing agency assigned a grievance officer to the project. A public information bulletin board was posted in each construction site communicating information about the project, the implementing agency, and the contractor as well as contact numbers for people to lodge grievances. There was also another option for filing grievances using the webpage of the Wuzhou municipal environmental protection bureau. No grievance was received from the local community and the general public with regard to the environmental impacts of the project.

² During the loan review mission from 1–3 June 2013, the requirement for project completion environmental monitoring and audit was discussed between the mission, the Wuzhou PMO, and loan implementation consultants. According to the EMP, the environmental acceptance monitoring and audit is required for the completed subproject. However, the Wuzhou PMO found that the legal environmental audits are not required for both the Pingminchong subproject and the Hongling subproject. Since some project components under two subprojects will go into the operational phase, the mission, the Wuzhou PMO, and the contracted monitoring station agreed to adjust the monitoring plan and to monitor the operation of those project components.

³ The population target of 100,000 by 2020 for the Hongling new urban district was established in the *Wuzhou Urban Master Plan, 2002–2020*, against the 2007 baseline of 4,000 people.

G. Conclusion and Recommendations

16. During construction, the contractors complied with the provisions of the EMP. Mitigation measures were effectively implemented. The residual impacts were insignificant. The environmental monitoring plan was properly executed in accordance with the EMP. All subprojects passed the project completion environmental audit by the Wuzhou municipal environmental protection bureau. Environmental monitoring during trial and formal operation showed that the air, water, and noise emissions during the operational phase were in compliance with national regulatory standards.

17. The environmental monitoring and reporting requirements were adequately met. The roles and responsibilities of relevant institutions for environmental management were adequately fulfilled, including the contractors, supervision companies, implementing agency, executing agency, municipal environmental protection bureau, municipal environmental monitoring station, ADB, and loan implementation consultants.

18. The project has taken into consideration lessons learned from other projects with regards to environment safeguards, especially on close monitoring of construction sites and spoil treatment practices. The successful environmental management and monitoring were achieved by the strong leadership of the executing agency, implementing agency, and project implementation consultant team on environmental management, proper institutional arrangements for coordination, competent role of the loan implementation consultants, as well as the incorporation of environmental protection investments into the overall project investment plan.

LAND ACQUISITION AND RESETTLEMENT

A. Introduction

1. A full resettlement plan was prepared for the Pingminchong Valley geohazard resettlement and prevention component and for the Hongling road network and related infrastructure component during loan processing in August 2008 to comply with the *Involuntary Resettlement Policy (1995)* of the Asian Development Bank (ADB). During project implementation, ADB updated and approved the resettlement plan for the Hongling component in August 2009 and for the Pingminchong component in May 2010.

B. Project Impact

2. After the landslide incident in the Pingminchong area on 12 June 2009, the Wuzhou Municipal Government (WMG) decided to take advance action to evacuate project-affected persons in the area to ensure their safety. As a result, houses and other structures in the geohazard-affected area were demolished between September and December 2009, despite the plan for the physical resettlement of affected persons originally scheduled in the third quarter of 2011 to Zaichong resettlement site. A total of 14.53 hectares (ha) of state-owned land was acquired, with a reduction of 4.74 ha due to technical optimization. Meanwhile, 166,000 square meters (m²) of residential structures were demolished, affecting 1,721 households and 5,345 persons. Compared with the figures in the updated resettlement plan, the demolished area of residential structures increased by 21,994.85 m², which was the final demolished area based on compensation agreements. A total of 13,652.23 structures from 24 enterprises and institutions were demolished.²

3. For the Hongling component, 85.9 ha of state-owned land and 54.37 ha of collective land were acquired, and collective land acquisition affected 891 households and 3,942 persons. A total of 5,612 m² structures from 20 enterprises and institutions were demolished. As per the updated resettlement plan for the Hongling component (August 2009), 318 households were affected by house demolition (within the right of way) in Longxin Village. Based on the survey conducted by the implementing agency in 2012, the number of affected households increased to 539 in Longxin Village and 47 in Longping Village due to change in the right-of-way boundaries or shifts in road alignments. As a result of the cancellation of road numbers 5, 22, 23, 24, 25, 27, 28, 29, 30, and 31 because of road realignment and delays in negotiating with affected persons, by March 2017 house demolition (63,422.30 m²) had affected 387 households and 1,793 persons, which included 340 households in Longxin Village and 47 households in Longping Village.

4. A change in scope was approved by ADB in December 2016 to discontinue ADB financing for Road No. 19. (CB05). ADB only financed part of the civil works under contract package CB05 until 30 September 2016 while the remaining works will be financed through domestic funds. This road is within project scope and resettlement is not completed for 37 households and 225 persons. Consultation and negotiations with these 37 households have been ongoing with regard to compensation, relocation, and income restoration options.

Table 15.1. Impact of Permanent Land Acquisition and Residential and Non-Residential House Demolishment

Project Components	Permanent Land Acquisition											
	Land (ha)				No. of Affected Households				No. of Affected People			
	Resettlement Plan	Updated	Actual	Change	Resettlement Plan	Updated	Actual	Change	Resettlement Plan	Updated	Actual	Change
Pingminchong geohazard resettlement and prevention	19.27	19.27	14.53	-4.74	0	0	0	0	0	0	0	0
State-owned land	19.27	19.27	14.53	-4.74	0	0	0	0	0	0	0	0
Collective land	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0
Hongling road network and related infrastructure	140.27	140.27	140.27	0.00	862	891	891	0	3,221	3,308	3,308	0
State-owned land	85.90	85.90	85.90	0.00	0	0	0	0	0	0	0	0
Collective land	54.37	54.37	54.37	0.00	862	891	891	0	3,221	3,308	3,308	0
Total	159.54	159.54	159.54	0.00	862	891	891	0	3,221	3,308	3,308	0
	Residential House Demolishment											
	Area (m ²)				No. of Affected Households				Affected People (no.)			
	Resettlement Plan	Updated	Actual	Change	Resettlement Plan	Updated	Actual	Change	Resettlement Plan	Updated	Actual	Change
Pingminchong geohazard resettlement and prevention	130,851.00	144,005.15	166,000.00	+21,994.85	1,816	1,721	1,721	0	5,707	5,345	5,345	0
Hongling road network and related infrastructure	57,187.13	59,687.13	63,422.30	+3,735.17	289 ¹	318	387	+69	1,374	1,461	1,793	+332
Total	188,038.13	203,692.18	229,422.30	+25,730.02	2,105	2,039	2,132	+69	7,081	6,806	7,138	+332
	Non-Residential House Demolishment											
	Area (m ²)				No. of Affected Enterprises				Affected People (no.)			
	Resettlement Plan	Updated	Actual	Change	Resettlement Plan	Updated	Actual	Change	Resettlement Plan	Updated	Actual	Change
Pingminchong geohazard resettlement and prevention	19,410.01	13,652.23	13,652.23	0	11	17	24	+7	1,116 ²	1,478	1,478	0
Hongling road network and related infrastructure	5,612.01	5,612.01	5,612.01	0	20	20	20	0	635	635	634	-1
Total	25,022.02	19,264.24	19,264.24	0	31	37	44	+14	1,751	2,113	2,112	-1

ha = hectare, m² = square meters.

Notes: 1. The number of households to be relocated is included in the number of households affected by permanent land acquisition.

2. The number of affected employees for family-owned shops is included in the number of affected persons to be affected by residential structure demolition.

Source: Asian Development Bank.

C. Resettlement Policy and Compensation Rates

5. Land acquisition and resettlement were implemented on the basis of the resettlement plans, the 1998 Land Administration Law, and the State Council Decision to Deepen Reform and Strictly Enforce Land Administration (Document 28, November 2004 [footnote 25]). Compensation for the permanent acquisition of construction land in Pingminchong was not required because it is state-owned land and was redeveloped for sale through an open bid auction. For the Zaichong resettlement site, the compensation standard for the construction land was CNY4,800,000 per ha, and the land compensation was paid directly to the Wuzhou Land Resource Bureau by the implementing agency. For the Hongling component, the compensation rates for permanent collective land acquisition were the same as or higher than those in the original resettlement plan and the updated resettlement plan (Table 15.2).

Table 15.2. Compensation Rates for Permanent Collective Land Acquisition of Hongling Component

Land Type	Unit	Resettlement Plan	Updated	Actual
Paddy land	CNY / ha	478,125	478,125	509,355
Dry land	CNY / ha	348,300	348,300	369,225
Vegetable land	CNY / ha	1,181,565	1,181,565	1,263,172.5
Fish pond	CNY / ha	737,685	737,685	797,355
Wood land	CNY / ha	201,240	201,240	201,240
Lychee land	CNY / ha	-	-	524,865
Garden land	CNY / ha	358,080	358,080	387,120
Village road	CNY / ha	195,000	195,000	195,000
House plot	CNY / ha	8,250	8,250	8,250
River bottom land	CNY / ha	30,960	30,960	30,960

CNY = Chinese yuan, ha = hectare.

Source: Asian Development Bank.

6. For the Pingminchong component, the implemented compensation rates for the demolished residential houses with certificates were higher than those in the resettlement plan (Table 15.3). Affected households without legal house certificates who settled on the land after 28 August 1998 or were able to prove their occupation of affected plots before the cut-off date issued by the WMG were entitled to compensation and assistance. There were 4,800 m² structures of this type identified. These houses were usually constructed of much poorer quality and were made of lower-cost materials. The updated resettlement plan did not set the detailed compensation rates for those types of houses but referred to as “others” to cover other types of structures. During implementation, the final rates were agreed on between the demolition agency and the displaced persons after a field appraisal by a real estate appraisal and surveying agency. The implementing agency verified that the formulation of compensation rates was based on replacement cost, which was evaluated by the real estate evaluation agency and consulted with the affected persons.

7. For the Hongling component, the actual compensation rates were the same in both the original and updated resettlement plans.

Table 15.3. Compensation Rates for Residential Structures Demolished

Table 10.9: Compensation Rates for Residential Structures Demolished					
No.	Type of Structures	Unit	Compensation Rate (CNY)		Actual
			Resettlement Plan	Updated Resettlement Plan	
A. Pingminchong Geohazard Resettlement and Prevention					
1	Frame	m ²	2,000	1,150–1,900	1,773–2,003
2	Brick–concrete	m ²	1,000	1,100–1,700	1,673–1,928

No.	Type of Structures	Unit	Compensation Rate (CNY)		Actual
			Resettlement Plan	Updated Resettlement Plan	
3	Brick-wood	m ²	750	1,000–1,600	1,589–1,823
4	Others	m ²		600–800	50–250
5	Relocation allowance	m ²	5	10	10
6	Transitional subsidy (3 months)	m ² /month		10	10
B. Hongling Road Network and Related Infrastructure^a					
1	Frame structure	m ²	470	470	470
2	Brick-concrete	m ²	420	420	420
3	Brick-wood	m ²	330	330	330
4	Simple structure	m ²	180		
4.1	Wood structure	m ²		180	180
4.2	Earth wall and tile roof house	m ²		150	150
4.3	Earth wall and grass roof house	m ²		100	100
4.4	Other structure	m ²		80	80
5	Relocation allowance for private households	m ²	3	5	5
6	Housing transition allowance	m ²	30	50	50

CNY = Chinese yuan, m² = square meter.

^a Compensation included the structures only. Compensation for the loss of house plot at CNY500 / m² is a separate item from house demolition if the affected household did not want to get the new housing plots.

Source: Asian Development Bank.

8. For the auxiliaries demolition, the original, updated and actual compensation rates were the same (Table 15.4), except for the rates for telephones and cable TV in the updated resettlement plan and actual implementation, which were slightly higher than the original resettlement plan. In the original resettlement plan, the water meter and electric meter will not be paid as new meters will be installed in the new building, but in the updated resettlement plan and actual implementation, compensation was paid at CNY250 per set respectively.

Table 15.4. Compensation Rates of Auxiliaries Demolishment

Table 10-1 Compensation Rates of Relocation Demonstration				
Item	Unit	Compensation Rate (CNY)		Actual
		Resettlement Plan	Update	
A. Pingminchong Geohazard Resettlement and Prevention				
Telephone	No.	150	160	160
Kitchen	No.	5,000	5,000	5,000
Balcony	No.	1,000	1,000	1,000
Water meter	Set	No compensation will be paid	250	250
Electric meter	Set	No compensation will be paid	250	250
Coal gas	Set	300	300	300
Toilet	No.	3,500	3,500	3,500
Cable TV	No.	160	182	182
B. Hongling Road Network and Related Infrastructure				
Telephone	No.	160	160	160
Kitchen	No.	5,000	5,000	5,000
Coal gas	Set	300	300	300
Toilet	No.	4,500	4,500	4,500
Cable	No.	120	120	120
Fence	m	50	50	50
Door	No.	100	100	100
Sunning ground	m ²	50	50	50
Aluminum alloy window	m ²	50	50	50
Anti-theft net with steel structure	m ²	20	20	20
Stainless anti-theft net	m ²	50	50	50
Air conditioner	No.	100	100	100
Simple pig and chicken house	m ²	100	100	100
Ground with color clays brick	m ²	20	20	20
Ground with durable wearing brick	m ²	30	30	30

Item	Unit	Compensation Rate (CNY)		
		Resettlement Plan	Update	Actual
Ground with mosaic brick	m ²	15	15	15
Ground with patterned brick	m ²	10	10	10
External wall with mosaic	m ²	15	15	15
External wall with strip patterned brick	m ²	30	30	30
Tomb (earth)	No.	500	500	500

CNY = Chinese yuan, m² = square meter.

Source: Asian Development Bank.

9. Both the Pingminchong and Hongling components involved the demolition of non-residential structures. Table 15.5 presents the detailed compensation and actual rates of non-residential structures in the resettlement plan. There were no changes in the compensation rates. Table 15.6 presents the detailed compensation rates for infrastructure and special facilities, which had no changes between the resettlement plan and actual compensation.

Table 15.5. Compensation Rates for Non-Residential Structures

Type of Non-Structures	Unit	Compensation Rate (CNY)		
		Resettlement Plan	Updated	Actual
A. Pingminchong Geohazard Resettlement and Prevention				
Frame	m ²	1,150	1,150	1,150
Brick-concrete	m ²	1,100	1,100	1,100
Brick-wood	m ²	900	900	900
Simple	m ²	600	600	600
Average stoppage subsidies for enterprises and institutes	CNY/each	1,500	1,500	1,500
Subsidies for affected employees	CNY/each	525	525	525
B. Hongling Road Network and Related Infrastructure				
Administrative Institutions				
Land acquisition	mu	84,000	84,000	8,400
Structure and auxiliaries	mu	9,100	9,100	9,100
Relocation allowance	mu	9,700	9,700	9,700
Subsidy for loss of employees' working time	CNY/day	35	35	35
Subsidy for loss of production stoppage	No.	1,500	1,500	1,500
Affected Enterprises				
Land acquisition	mu	303,600	303,600	303,600
Structure and auxiliaries	mu	9,100	9,100	9,100
Relocation allowance	mu	9,700	9,700	9,700
Subsidy for loss of employees' working time	CNY/day	35	35	35
Subsidy for loss of production stoppage	No.	1,500	1,500	1,500

CNY = yuan, mu = Chinese unit of land measurement that varies with location but is commonly 806.65 square yards (0.165 acre, or 666.5 square meters), m² = square meter.

Source: Asian Development Bank.

10. For infrastructure and special facilities, the compensation rates are the same as in the resettlement plan (Table 15.6).

Table 15.6. Compensation Rates for Infrastructure and Special Facilities

Item	Unit	Compensation Standards (CNY)	
		Resettlement Plan	Actual
A. Pingminchong Geohazard Resettlement and Prevention			
Public toilet	m ²	800	800
10KV electric pole	No.	2,500	2,500
380V electric pole	No.	2,000	2,000
Transformer (kVA)	No.	150,000	150,000
Water culvert (concrete)	m ²	150	150

Item	Unit	Compensation Standards (CNY)	
		Resettlement Plan	Actual
Communication cable	m	20	20
Communication cable	m	30	30
Optical cable line of cable TV	km	30,000	30,000
Communication cable	km	20,000	20,000
Distribution net of cable	HH	100	100

cm = centimeter, HH = household, kVA = kilovolt-ampere, km = kilometer, KV =kilovolt, m = meter, m² = square meter, mm = millimeter.

Source: Asian Development Bank.

D. Resettlement Measures and Income Restoration

11. **Pingminchong component.** According to the original resettlement plan, the majority of households would like to receive cash compensation or replacement houses in the Zaochong resettlement site. After the landslide incident in Pingminchong area on 12 June 2009, the WMG decided to fast-track the evacuation of project-affected persons to ensure their safety. However, the establishment of the Zaochong community in the original plan had not yet been completed. The WMG decided to purchase 2,690 commercial apartment units ready for occupancy based on people's needs and capacity to pay in eight different locations within the city. The objective was to relocate all affected persons as soon as possible. During consultation, resettlement housing brochures, which included detailed information about the location, types of apartments, and prices, were distributed to affected persons on 10 June 2009. The government encouraged the households to select the relocation options based on the family's financial status. The Zaochong resettlement housing site was also included among the choices. Among the 1,721 households, 389 households (169 households in Zijinghuayuan, 31 households in Baiyunbao, 36 in Jufumincheng, 36 in Xinglangmingdu, and 117 in Yunlong) moved to commercial housing subsidized by the WMG, 558 households moved to the Zaochong resettlement site, 85 moved to affordable housing (Fumin and Hongling Minle), 370 moved to low income rental housing (Fumin No. 19 Fuminshan Road), 68 moved to commercial housing found by the affected persons in the market, and 251 acquired second hand housing.¹ The facilities, services, and living conditions improved, such as the water supply, electricity, sewage pipe network, cable television, internet access, and parking areas. The survey conducted by the external monitoring consultants and the interviews conducted during the project completion report mission concluded that all of the Pingminchong affected persons considered the move from the geohazard-prone area to their new housing an improvement of their living environment and personal safety. The move to commercial and subsidized commercial apartments was a personal choice for these affected persons. Affected households made decisions based on their lifestyles, preferred locations, apartment prices, financial status, and family needs. Some affected households selected the apartments where the cost could be covered with the compensation, while some opted for smaller and more affordable spaces to get savings from the compensation. Others paid additional costs from their personal funds or borrowed money from friends and/or relatives or commercial banks because they viewed this as an opportunity to improve their living conditions and purchase a bigger house. A total of 558 households selected the Zaochong resettlement site because of more choices of housing styles and prices, as Zaochong was designed especially for resettlement of the project. Compared with other apartments in the same location and same quality in the market, its average price was CNY500 lower when the affected households bought them. The households received transitional subsidy. They demolished their houses and handed over their land in December 2009 and moved to the Zhaochong relocation site in December 2010. The replacement housing area is equivalent to their original housing. Relocated shop owners had the first choice among available

¹ Second hand housing means the houses sold by owners at the market.

commercial spaces on the ground floor where they could reestablish their business. For enterprises and institutions, the government assisted them to find the new land and complete the approval procedures. There were also 24 enterprises, institutions, and shops relocated, and no job losses occurred.

12. Out of the 370 households, there were 351 vulnerable households, including “households enjoying five guarantees,” the minimum-standards residents, families of disabled people, female-headed households, and households owning small residences (less than 12 m²/per capita). These families chose affordable houses or low rental houses. Low rental houses are very cheap at only 1.66 yuan/m² per month so these families had better living environments by paying only a small part of their incomes. Even though they have no property rights, they can spend the compensation for their children’s education or start a business. In the long term, this is helpful for them to improve their living environment and quality of life. Meanwhile, families who purchased affordable houses (50 m²–80 m²) paid their houses from the compensation they received.

13. In addition to relocation house, other income rehabilitation measures were implemented for the affected persons, including providing employment during construction and operation and skills training. By March 2017, 30 workers are employed for landscaping and security guards in the relocation sites. From 2013 to 2016, about 1,300 persons received targeted training. The sample households survey conducted by the external monitor verified that the income of affected persons increased.

14. **Hongling component.** Three options were provided to affected households that included cash compensation, replacement apartment, or provision of housing plots. All 387 households selected the housing plots. If the house plot of the original house was more than 90 m² and 100 m², 100 m² of the plot was provided. If the house plot of the original house was more than 75 m² but less than 89 m² and 80 m² of the plot were provided. If the house plot of the original house was more than 65 m² but less than 74 m², 70 m² of the plot was provided. If the house plot of the original house was less than 64 m², 60 m² of the plot was provided. For those who did not want to have a replacement house plot, compensation standard for the house plot was CNY500/m². The government was responsible for the infrastructure of the relocation sites.

15. Among the 387 affected households, house demolition and relocation of 340 households in the Longxin Village were implemented smoothly and completed in April 2012. A total of 215 households were relocated in the Longxin I relocation site, and 125 households were relocated in the Longxin II and III relocation sites. Affected households constructed five-story houses. Because of the good location of both sites, some affected households rent out a few floors to get extra income. The affected households were satisfied with the better-quality housing and improved infrastructure such as paved roads, water supply, and electricity connections.

16. For the 47 affected households in Longping Village, 12 households signed the agreements and obtained their housing plots in December 2013. House demolition was completed in March 2017 as negotiations with the remaining 35 households took nearly 4 years. In 2013, two different options were offered to the 35 households: (i) house plots where affected persons can self-build their houses or (ii) apartment housing with property rights certificate in a centralized resettlement community site and allocation of commercial spaces in the city center. However, the 35 households stayed behind, giving the following reasons: (i) the location of the proposed house relocation site was not close to their original houses; (ii) compensation rates offered to them should be higher due to cost inflation of construction materials; and (iii) the relocation site at Longxin Village was better than the proposed location in Longping Village. From 2013 to 2016, there were several rounds of consultations and the government took the following measures to

solve the issues: (i) housing plots at six relocation sites were offered to the households to choose from; (ii) if the households believed that the compensation was not enough to reconstruct the new house, they could entrust the government to construct the house; and (iii) the government would build the foundation of the houses. As a result, the remaining 35 households signed the agreement and selected the relocation sites (housing plots) by March 2017, and the government would build the foundation of their houses. Housing plots were given to 15 households and the houses are under construction. The other 20 households selected the Longping No. 3 relocation site (still under construction) so they had been staying with relatives or in rented rooms in anticipation of the handover in December 2017.

17. There were 20 enterprises and institutions relocated, and no employee lost a job. The PMO, implementing agency, and local governments provided necessary assistance for house construction and relocation during resettlement implementation. Affected owners and employees were compensated in cash for income losses resulting from reduced production, sales, and wages caused by the project.

18. For collective land acquisition, the resettlement subsidy and the compensation for crops were paid to the affected households while the land compensation fee was used for community affairs and investment. In accordance with the regulation of the WMG, construction or commercial land that was 5% of the total acquired land should be allocated to affected villages.² For example, Longxin Village got 240 *mu* of land and built a warehouse to get rent. The location of the land is good for business and will benefit villagers in the long term. Each year, the village committee will discuss how to spend the rent.

19. In addition to cash compensation, other income rehabilitation measures were implemented for the affected persons, including providing employment during construction and operation (workers in charge of landscaping and cooking meals and security guards) and skills training. After land acquisition, the cadres of the villages in association with the Labor Bureau conducted a survey in 2010 to identify the training needs of affected persons and the labor requirements from the factories. As a result, targeted trainings were provided by labor bureau, 2 vocational schools and 4 factories to improve skills in construction, electrical work, domestic help services, beauty, and hairdressing. From 2013 to 2016, about 1,500 affected persons received training. Also, special job fairs were organized for the affected farmers in each industrial zone in Wuzhou City. According to the statistic from the Labor Bureau, at least 90% of the affected persons got jobs after trainings while others started small business with the compensation. The sample households survey conducted by the external monitor verified that the income per capita of affected persons increased in Longxin Village from CNY5,307 in 2011 to CNY6,830 in 2016 and in Longping Village from CNY5,104 in 2011 to CNY6,350 in 2016.

E. Resettlement Cost

20. The total actual cost of compensation for land acquisition, relocation, and other affected assets was CNY546.35 million, 88.96% of the CNY614.15 million estimated in the updated resettlement plan and 114.62% of the CNY476.65 million estimated in the original resettlement plan. Table 15.7 provides details of the resettlement costs. For the Pingminchong component, house demolition was completed in just 3 months so there were administrative and contingency cost savings. For the Hongling component, the 47 households in Longping Village were not

² In practice, the construction or commercial land is provided after land acquisition for several projects, so that the villages can get a large area of land, rather than a small piece of land which is difficult for development. Longping village has not applied for the construction land from the government.

included in the updated resettlement plan, which increased the costs.

Table 15.7. Land Acquisition and Resettlement Cost

	Cost Estimates (CNY 1,000)		
	Resettlement Plan	Updated	Actual
Pingminchong Geohazard Resettlement and Prevention	221,251.459	337,429.86	279,500 (82.83%)
Hongling Road Network	255,399.18	258,723.45	266,850 (103.14%)
Total	476,650.64	596,153.31	546,350 (91.65%)

CNY = Chinese yuan.

Note: \$ 1 = CNY 6.8.

Source: Asian Development Bank.

F. Institutional Arrangements

21. There was a well-organized institutional structure for the management and implementation of the resettlement work. The staff from each component resettlement unit were responsible for coordinating the planning, implementation, financing, and monitoring of land acquisition and resettlement by working closely with resident and village officials, land resources bureau, house demolition offices, and other organizations involved in the implementation of resettlement programs. They were also responsible for supervising and monitoring the resettlement (e.g., delivery of entitlements, relocation and selection of new housing sites, restoration of incomes, provisions of economic rehabilitation measures). Of the total resettlement staff involved in the resettlement implementation, over 30% were women.

G. Implementation Schedule

22. House demolition of the Pingminchong component commenced in September 2009 and was completed by the end of December 2009. Construction of the host area in Zaichong started in March 2009 and was completed in March 2012, and all affected persons from the Pingminchong Valley moved into the new resettlement houses by the end of June 2012. The house demolition for the Hongling component started in September 2009 and was completed in March 2017. For the Hongling component, all compensation payments for land acquisition were paid to the villages and affected people in December 2009.

H. Monitoring and Evaluation

23. The consultants included internal resettlement monitoring at the beginning of the project in progress reports between October 2009 and December 2010. There were 27 progress reports prepared that included resettlement. The Wuzhou PMO engaged an external resettlement monitoring agency (Wuzhou College) from January 2011 to December 2016. Fourteen semiannual resettlement monitoring and evaluation reports were submitted on time to the PMO and ADB. As part of the loan agreement, annual survey updates have been undertaken for 2 years after completion of the resettlement activities.

I. Participation and Information Disclosure

24. Stakeholder participation and consultation took place throughout the project cycle, contributing to the efficient implementation of land acquisition and resettlement, particularly for

the Pingminchong component. Various stakeholders included the affected households, affected villages, local government, and design institutes who took part in resettlement planning and in the formulation of the compensation fund delivery and income rehabilitation programs. Information about the project and the resettlement policy were widely disseminated before and during project implementation. Consultation meetings were held with local governments, village and street committees, and representatives of affected households during implementation to discuss issues such as the (i) selection of relocation sites, (ii) distribution and use of community compensation funds, (iii) design of the relocation houses, and (iv) provision of training and job opportunities.

25. The resettlement information booklets for the Pingminchong and Hongling components were distributed to affected persons in August 2008 during the project preparatory technical assistance and before the start of resettlement activities. There were also copies of the resettlement plans in Chinese posted at resident community and village offices. The resettlement plans were also uploaded on the ADB website (in English and Chinese) in August 2008.

26. For the Pingminchong component, the local government organized 13 subteams to conduct a detailed measuring survey and consultations with the households from May 2009 to December 2009. To facilitate the selection of housing, resettlement housing brochures, which included detailed information about the location, types of apartments, and prices, were distributed to affected persons on 10 June 2009. Through the opening of a site in Pingminchong, a one-stop arrangement, where bank account opening, loan processing was processed efficiently.

27. House demolition in Longping Village for the Hongling component took a long time, but it demonstrated the local government's people-centered approach by facilitating consultations to solve issues.

28. The grievance redress mechanism at the village and/or township and/or district levels was well established and communicated clearly in the resettlement information booklets. In general, resolution of grievances took only a month. However, for the 35 households whose concerns were deemed to be more complex, it took longer for the affected persons and government to reach an agreement. Since the entire resettlement and rehabilitation program was carried out with the participation of affected persons, no major grievance issues arose during the implementation period. Most complaints were received and resolved at the village level.

J. Conclusions and Lessons Learned

29. The Wuzhou PMO and implementing agency consulted extensively with local governments, affected communities, and affected persons throughout the implementation of land acquisition and resettlement. An effective resettlement executing team and organizational structure was established, particularly for the Pingminchong component. All agencies related to land acquisition and house demolition worked proactively to solve problems raised by affected persons. The grievance redress mechanism worked well, and the PMO and each implementing agency addressed complaints quickly. The external monitor and implementation consultant was mobilized in a timely manner. The implementing agency and local governments made great efforts to improve the incomes of affected persons and relocate the affected households. Although there was a serious delay for the remaining 35 households in Longping village for the Hongling component, with long-term consultation and actions conducted by the local government, the 35 households eventually signed the agreement and house demolition was completed in March 2017.

30. There were good practices from the implementation of the Pingminchong component.

First, during the project planning stage, a “no relocation before compensation” policy was fully applied to the project. After the landslide incident in Pingminchong area on 12 June 2009, the WMG decided to evacuate project-affected persons to ensure safety even though the establishment of Zaochong community in the original plan had not been completed. Second, the WMG then purchased 2,690 commercial apartment units to relocate affected households in advance, and the relocation houses provided to them included commercial houses, relocation houses constructed by the government, affordable houses, and low rental houses, so that all households had a choice based on their needs and affordability.

31. Lessons learned from delays for the remaining 35 households in Longping village for the Hongling component included the following: (i) during the updating of the resettlement plan, the house demolition impacts of Longping Village were not fully identified during detailed measurement survey; (ii) before house demolition, the relocation plan was not adequate, especially the location of the relocation sites; and (iii) although Longxin Village and Longping Village are both located in the Hongling Zone of the Changzhou District, the relocation of affected households in Longxin Village and Longping Village was conducted by two township governments, respectively. District level government coordination was not adequate, especially in selecting relocation sites.

K. Mitigation of Social Risks

32. The main social risk during construction came from land acquisition and resettlement. Extensive consultations and negotiations were carried out with the affected persons during project implementation. This approach helped local people to understand the project and its resettlement policies, which helped mitigate potential social risks. The WMG and the implementing agency, in cooperation with local district and/or township governments, and street and village committees provided timely and adequate compensation and assistance to the affected households. In addition to cash compensation, income rehabilitation measures were also undertaken for the affected persons including (i) providing employment positions during construction and operation such as cooks, landscapers, and security guards; (ii) developing new enterprises and self-employed secondary and tertiary businesses (e.g., clothing, grocery, transportation, cargo, community service, repair, hairdressing salon, beauty salon, dry cleaning services, entertainment, and catering services); (iii) purchasing social insurance; and (iv) technical training to improve employability in other institutions, enterprises, and businesses.

33. Relocated institutions, enterprises, and shops were provided with the options of compensation and resettlement. The same institutions, enterprises, and shops reemployed the affected employees, and no job loss occurred. Farmers who lost land also received preference in getting jobs with project contractors. Technical training was provided to the affected persons to improve their skills given the increased demand for community services such as business management, tourism management, driving, security, cleaning, nursing, landscaping repairs, housekeeping, and catering services. According to the resettlement monitoring and evaluation reports, affected households were satisfied with their compensation packages. Income and livelihood restoration schemes were implemented, and the incomes and livelihoods of affected people were effectively restored and improved.

L. Follow-up Actions

34. ADB and the PMO have agreed that the following actions will be conducted: (i) accelerate the construction of the Longping phase III relocation site so that the housing plots can be handed over to the 20 affected households by December 2017; and (ii) conduct further consultations and

conclude the negotiations on house demolition compensation, transitional allowances, provision of house plots or any other relocation method chosen by the affected households, and income restoration opportunities and training with the remaining 37 households for Road No 19. The PMO will monitor progress of remaining resettlement for at least 2 years after circulation of the project completion report. The PMO will submit semiannual monitoring reports to ADB. It is expected that the relocation of the 37 households will be concluded within next two years and the status will be reported in the semi-annual monitoring reports.

SOCIAL IMPACT AND POVERTY REDUCTION

A. Introduction

1. The Wuzhou Urban Development Project consists of three components in Wuzhou City, including (i) Pingminchong geohazard resettlement and prevention, (ii) Hongling road network and related infrastructure, and (iii) capacity development and institution building. The project was intended to strengthen urban sustainability and improve the quality of life for urban residents in Wuzhou City by (i) reducing the geohazard threat to life and property and associated economic loss, (ii) providing additional geohazard-free land for urban redevelopment, (iii) providing roads and associated basic infrastructure to promote and facilitate urban expansion away from geohazard-prone areas, and (iv) introducing and establishing geohazard forecasting and an early warning system. Appendix 16 provides a reevaluation of the social and poverty reduction impact upon project completion.

B. Direct and Indirect Impacts

2. The project beneficiaries include direct and indirect areas. The direct project area (DPA) for the Pingminchong geohazard resettlement and prevention component covered the geohazard-prone areas of Pingdong and Pingxi Resident Committees in Pingminchong Valley to be relocated to geohazard-free areas. The direct beneficiaries are former residents and employees, business owners, teachers, and students in institutions, enterprises, and shops within the two resident committees of Pingminchong Valley and who benefited from the geohazard resettlement and prevention. The DPA for the Honglong road network and related infrastructure component is defined based on the projected number of people who would get access to the urban road transport service. The population in the DPA directly benefited from the availability and reliability of the services, and reduced pollution and improved urban environment. The indirect project area is defined as the area outside of the DPA that is likely to experience a better quality of life because of improved geohazard prevention and control, and road network.

3. Based on the defined project beneficiary areas, the project has directly benefited 563,000 Wuzhou urban residents, in comparison to the population of 486,000 at appraisal. Of these, 23,000 persons or 3.65% were urban poor in the project areas, in comparison to 20,410 persons or 4.2% of the urban poor in Wuzhou in 2008. Of the total 2,260 employment opportunities generated, over 30% were provided to women and over 20% to poor and ethnic minorities. The implementing agency and contractors trained local unskilled laborers on occupational health and safety issues, including HIV/AIDS and gender sensitivity, before they started to work on the construction sites. The contractors were contractually required to prioritize vulnerable groups for jobs and training opportunities. The project bidding documents included HIV/AIDS clauses under occupational safety and environmental protection. Monitoring was done through construction supervision reports. The Wuzhou Municipal Government (WMG) supported the implementing agency training local community members to use local laborers for the project, including women and the poor. Gender issues and labor targets were addressed through labor recruitment and community-based activities on HIV/AIDS and environmental education by the municipal health bureau and the environmental protection bureau.

C. Employment and Income Benefits

4. The project directly and indirectly provided jobs to local residents during construction and operation. It has and will provide positive effects on poverty reduction through the direct provision of about 5,070 person-years of employment opportunities and 320 full-time jobs as skilled and

unskilled job positions during project construction and operation period, respectively. The poor accrued approximately CNY59 million in salary over the construction period, and the poor earned CNY4.6 million of wage payments per year over the operational period. In addition, with the completion of the road network and related infrastructure, about 2,260 short-term jobs created during project implementation, of which about 50% taken by vulnerable groups including women (about 30%), and poor and ethnic minorities (about 20%). Over 10,000 short-to-medium term new jobs were created for the local labors in the Hongling road project area to prioritize the poor and vulnerable. At completion, the project also benefited women, who bear primary responsibility for housework, including cleaning up the interior and exterior of the houses after floods and geohazards and caring for the sick, children, and elderly, and for household related traveling and socializing activities. Time and effort spent on these activities would mean less time for income-generating activities or family entertainment or leisure time. The implementing agency implemented proactive employment programs for women. Priority was given to women for employment and skills training, with more than 20% of women being employed during the project construction and operation phases.

D. Improvement of Living Standards

5. The Pingminchong geohazard resettlement and prevention component has reduced the geohazard threat to life and property in Wuzhou. After the implementation of the project, affected persons in the Pingminchong community were resettled in new communities free from geohazard threats such as landslides, collapses, and debris flows caused by heavy rain.

6. The road construction has facilitated mobility and access for local populations to key basic services and destinations, and removed related constraints for urban development. It has saved travel time, reduced vehicle operation costs, improved road safety, and reduced traffic accidents. The provision of special design features for the road network has contributed to a better life for local residents. These design features included pedestrian access with sidewalks, safe crossing zones, appropriate road safety signs, particular attention to safety issues for children at school areas, non-motorized transport lanes, location of bus stops, lighting or bus stop covers, and the provision of affordable and reliable public transportation.

E. Community Geohazard and Environment Awareness Program

7. During project implementation, the implementing agency coordinated closely with the Wuzhou Land Resource Bureau and collaborated with mass media organizations, schools, and local communities to carry out the community geohazard and environmental awareness program proposed during appraisal. Mass media (TV, radio forecasting, newspapers, magazines), brochures, posters, bulletin boards, mobile phones, and community meetings were used to reach communities for geohazard and environmental awareness building. In addition, space has been made available for community development to enable local communities to carry out their mass media activities, capacity development and meetings. Public green spaces, community center, and other community service facilities were provided under the project. In addition to the implementation of geohazard early warning and forecasting system, the program helped reduce damage to life and property and achieved more efficient and effective geohazard prevention and control.

F. Socioeconomic Development

8. The improvement of the urban infrastructure and living environment has enhanced the ability of Wuzhou City to attract more investments and thus promote economic growth, revenues,

and local employment. Table 16.1 shows the socioeconomic growth in Wuzhou City.

Table 16.1. Socioeconomic Growth in Wuzhou City

Indicator	2015 ^a	2014 ^b	2013 ^b	2012 ^b	2011 ^b	2010 ^c	2009 ^d	2008 ^e
GDP (CNY billion)	107.86	106.48	99.17	83.10	73.52	57.37	44.75	40.01
Local fiscal revenue (CNY billion)	12.37	12.24	11.82	10.1	7.61	5.613	4.006	3.242
Gross industrial output value (CNY billion)	218.55	197.80	180.40	135.72	116.67	86.58	61.94	58.23
Total investment in fixed assets (CNY Billion)	106.13	92.64	85.03	65.09	63.29	46.842	33.04	19.83
Disposable income per capita for urban residents (CNY)	25,898	24,272	22,537	20,563	18,239	16,427	14,747	13,268
Net income per capita for rural residents (CNY)	9,051	8,342	7,475	6,592	5,651.4	4,879	4,218	3,854

CNY = yuan, GDP = gross domestic product.

^a Data from the website of the Guangxi Zhuang Autonomous Region Bureau of Statistics.

http://www.gxtj.gov.cn/tjsj/tjgb/sxgb/201605/t20160518_123723.html.

^b Data from 2011 to 2014 from the Guangxi Zhuang Autonomous Region government information open unified platform: <http://www.wuzhou.gov.cn:8888/govinfo/documentAction.do?method=toDocView&docId=4bcff9ac-14a6-497f-9c60-371610e8f7db&moduleId=44d55882-60cc-4678-a29a-0bf351546be5>.

^c Data from the 2010 Statistics Bulletin of the National Economic and Social Development of Wuzhou: http://www.tjcn.org/tjgb/201409/27445_2.html.

^d Data from the 2009 Statistics Bulletin of the National Economic and Social Development of Wuzhou: <http://www.tjcn.org/plus/view.php?aid=11983>.

^e Data from the 2008 Statistics Bulletin of the National Economic and Social Development of Wuzhou: <http://tj.100xuexi.com/view/otdetail/20100726/7A7F2802-4259-405D-A395-61DF8E8C59F8.html>.

Source: Asian Development Bank.

9. Increased socioeconomic development and investments have provided an enabling environment for attracting the public and private sectors to invest in further development of the geologically treated and geohazard-free Pingminchong Valley and the geohazard-free new Hongling urban district, thus providing employment and income-generating opportunities for local residents.

G. Poverty Reduction

10. In Wuzhou City, many poor people live in geohazard-prone areas with poor facilities and community services. The population was densely concentrated and housing, sanitation, and environmental conditions were very poor including serious water and soil erosion, environmental pollution, and problems with garbage and wastewater. More significantly, people faced serious threats to life and property and associated economic losses due to from geohazard disasters like mountain collapses and landslides. During rainy seasons, the people lived in fear worrying about landslide threats and the lack of road networks to access services and facilities, particularly during emergencies.

11. The project has contributed to local employment and poverty reduction by (i) reducing the geohazard threat to life and property and associated economic loss; (ii) providing additional geohazard-free land for urban redevelopment; (iii) providing roads and associated basic infrastructure to promote and facilitate urban expansion away from geohazard-prone areas, introducing and establishing geohazard forecasting and early warning system; (iv) increasing employment and income generation opportunities for temporary job creation during the construction phase and permanent job creation during the operational phase; (v) adding value from local procurement; (vi) creating skilled and unskilled construction employment equally accessible to men and women; (vii) improving investment conditions to stimulate the development

of local economy to create new jobs and income-generating opportunities and accelerate urban development of Wuzhou City; (viii) accelerating tourism development ; and (ix) increasing land and property values. As a result, the local residents of Wuzhou City can enjoy a better quality of life with reduced poverty, increased employment, investment and business opportunities, and improved safety.

12. The poor and most vulnerable groups benefited the most from reduced geohazard risks because they were the least capable of coping with them. Safer and better living standards for poor and low-income households have reduced poverty in the project area. The improved road network has improved their mobility and access to public services and employment opportunities that are often lacking in poor areas. As a result, the project complements the People's Republic of China's poverty alleviation efforts.

H. Conclusion

13. The project has contributed to addressing geohazard threats in Wuzhou City and saving thousands of people from the threat of geological disasters, thus promoting sustainable urban development and improved quality of life for local residents. This has provided an enabling environment for poverty reduction directly and indirectly for Wuzhou by (i) reducing the geohazard threat to life and property and the associated economic loss; (ii) introducing and establishing a geohazard early warning and forecasting system, and strengthening the geohazard and environment awareness program; (iii) increasing employment and income-generating opportunities from temporary job creation during the construction phase to permanent job creation during the operational phase; (iv) increasing mobility and access for local populations to key basic services and destinations; (v) saving travel time, reducing vehicle operation costs, improving road safety, and reducing traffic accidents; and (vi) providing additional geohazard-free land for urban redevelopment, and promoting and facilitating urban development away from geohazard-prone areas.

14. Environmental and socioeconomic benefits have been brought to Wuzhou residents, thus enhancing their quality of life and health conditions. Benefits have accrued especially for the poor who are most vulnerable to poor environmental and sanitary conditions. Vulnerable populations and women were targeted for employment opportunities generated by project investments. The project has complemented the People's Republic of China's effort to ensure environmental sustainability and reduce urban poverty. Overall, the project is recognized by affected people and local beneficiaries as a success.