



# Report and Recommendation of the President to the Board of Directors

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Project Number: 44035  
November 2012

Proposed Loan  
People's Republic of China: Ningxia Irrigated  
Agriculture and Water Conservation Demonstration  
Project

Asian Development Bank

## CURRENCY EQUIVALENTS

(as of 19 November 2012)

Currency unit	–	yuan (CNY)
CNY1.00	=	\$0.1604
\$1.00	=	CNY6.2356

## ABBREVIATIONS

ADB	–	Asian Development Bank
EMP	–	environmental management plan
ha	–	hectare
NARC	–	Ningxia Agricultural Reclamation Group Co., Ltd.
NHARG	–	Ningxia Hui Autonomous Region government
PAM	–	project administration manual
PIO	–	project implementing office
PPMO	–	provincial project management office
PRC	–	People's Republic of China

## NOTES

- (i) The fiscal year of the Government of the People's Republic of China and its agencies ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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## PROJECT AT A GLANCE

<b>1. Project Name:</b> Ningxia Irrigated Agriculture and Water Conservation Demonstration Project		<b>2. Project Number:</b> 44035-014	
<b>3. Country:</b> China, People's Republic of		<b>4. Department/ Division:</b> East Asia Department/Environment, Natural Resources, and Agriculture Division	
<b>5. Sector Classification:</b>			
<b>Sectors</b>		<b>Primary</b>	<b>Subsectors</b>
Agriculture and natural resources		√	Irrigation, drainage, and flood protection
			Agriculture and rural sector development
			Land-based natural resources management
			Water-based natural resources management
<b>6. Thematic Classification:</b>			
<b>Themes</b>		<b>Primary</b>	<b>Subthemes</b>
Economic growth		√	Widening access to markets and economic opportunities
Environmental sustainability			Natural resources conservation
<b>6a. Climate Change Impact</b>		<b>6b. Gender Mainstreaming</b>	
Adaptation	Medium	Gender equity theme (GEN)	
Mitigation		Effective gender mainstreaming (EGM) <span style="float: right;">√</span>	
		Some gender elements (SGE)	
		No gender elements (NGE)	
<b>7. Targeting Classification:</b>		<b>8. Location Impact:</b>	
<b>General Intervention</b>	<b>Targeted Intervention</b>		
	<b>Geographic Dimensions of Inclusive Growth</b>	<b>Millennium Development Goals</b>	<b>Income Poverty at Household Level</b>
√			
		National <span style="float: right;">Low</span>	
		Rural <span style="float: right;">High</span>	
		Urban <span style="float: right;">Low</span>	
<b>9. Project Risk Categorization:</b> Low			
<b>10. Safeguards Categorization:</b>			
		Environment	B
		Involuntary resettlement	C
		Indigenous peoples	B
<b>11. ADB Financing:</b>			
<b>Sovereign/Nonsovereign</b>		<b>Modality</b>	<b>Source</b>
Sovereign		Project loan	Ordinary capital resources
<b>Total</b>			<b>70.0</b>
<b>12. Cofinancing:</b>			
No cofinancing available.			
<b>13. Counterpart Financing:</b>			
<b>Source</b>			<b>Amount (\$ million)</b>
Ningxia Agricultural Reclamation Group Co., Ltd.			27.2
Local governments of Hongsipu district, and Tongxin and Yanchi counties			9.2
<b>Total</b>			<b>36.4</b>
<b>14. Aid Effectiveness:</b>			
Parallel project implementation unit		No	
Program-based approach		No	

## I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the People's Republic of China (PRC) for the Ningxia Irrigated Agriculture and Water Conservation Demonstration Project.<sup>1</sup>

2. The project will improve the value of horticultural crops by planting high-value and high-quality varieties, constructing water conservation infrastructure, promoting sustainable farming practices, and developing institutional capacity.<sup>2</sup> The project will be implemented in Hongsipu district, Tongxin and Yanchi counties, and six farms of the Ningxia Agricultural Reclamation Group Co., Ltd. (NARC) in the Ningxia Hui Autonomous Region (Ningxia).<sup>3</sup>

## II. THE PROJECT

### A. Rationale

3. Ningxia, located in the northwest region, is one of the PRC's ethnic minority regions, with a total area of 66,400 square kilometers and a population of 6.2 million, of which 2.2 million (36%) are Hui minority. Ningxia is largely arid and semiarid, with dry and harsh winters and hot summers.

4. **Poverty.** Ningxia lags the rest of the PRC in terms of income and well-being. In 2010, Ningxia's per capita gross domestic product was CNY26,860, below the national average gross domestic product of CNY29,762. A large income disparity also exists between urban and rural residents in Ningxia, with the average urban income (CNY15,334) more than 3 times that of rural income (CNY4,675) in 2010. In 2011, more than 1 million people or about 25.6% of the region's rural population were living below the national poverty line.<sup>4</sup> One solution to reducing poverty and the gap between rural and urban income is to improve farming practices and crop quality to increase the incomes of crop growers in the agriculture sector.

5. **Horticultural development.** Agriculture remains an important sector in Ningxia. The vast plain of the Yellow River in the north has been irrigated for centuries. In the central arid and semiarid areas where the project is located, extensive irrigation infrastructure has been built since the 1960s. Several large lift irrigation schemes were built in the 1980s to divert water from the Yellow River and transformed central Ningxia dryland farm areas into an irrigated agriculture area. Corn is the main grain crop in the project area. Since the late 1990s, the Ningxia Hui Autonomous Region government (NHARG) has been promoting the development of horticultural crops to improve land and water productivity, and farmer incomes. Grapes and Chinese dates—two of the major horticultural crops in the project area—are promoted as priority, high-value, water-efficient crops in NHARG's Twelfth Five-Year Plan, 2011–2015. NHARG also has a 10-year plan to develop 666,670 hectares (ha) of vineyards by 2020; NARC, a commercialized state-owned enterprise, will play a key role in achieving this target.

6. Since the late 1990s, the expansion of vineyards in Ningxia has been rapid and significant. This was achieved largely using low technology and poor vineyard management practices. Farmers' on-farm management skills for grapes are low. This starts with selecting

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<sup>1</sup> The design and monitoring framework is in Appendix 1.

<sup>2</sup> The Asian Development Bank (ADB) provided project preparatory technical assistance.

<sup>3</sup> The subproject locations are detailed in the Project Administration Manual, para. 20 (accessible from the list of linked documents in Appendix 2).

<sup>4</sup> The government's official poverty line in 2011 was CNY2,300 per capita net income per year.

varietals and designing the layout of each vineyard, and extends to managing the vines and canopy and to harvesting practices. More training and extension services are required to improve farmers' skills in vineyard management.

7. Chinese dates are the key cash crop for Tongxin and Yanchi counties. While local varieties of dates can tolerate dry and low temperature conditions, the yield and quality of the existing date orchards are mostly low because of continuous drought and poor on-farm management. Date production will be improved by providing reliable irrigation and improved farming technology and management. High-quality dates will earn farmers a higher price, and thus higher incomes.

8. **Water use efficiency.** The farming systems in Ningxia's arid and semiarid areas depend on water availability. The project area is characterized by low precipitation, mostly late in the cropping season. Irrigation is essential during early crop-growing stages. Water resources are limited, but flood irrigation is still practiced widely even for horticultural crops, resulting in low water use efficiency. Improvement in water use efficiency by the agriculture sector is paramount for increasing agricultural productivity and crop quality. New agricultural land can be subsequently developed as more water becomes available after water is saved from better irrigation efficiency. Controlled irrigation can also reduce water used by crops, improve crop quality, and reduce soil salinity.

9. **Marketing and business strategy.** NARC produces grapes through seven farms of a wholly owned subsidiary, Xixia King Industrial Co. Ltd., which runs its wine business through Xixia King Winery. It is vital to NARC's business profitability that the two companies operate viable and sustainable vineyard and winery businesses. NARC's current production model lacks advanced farming technology, resulting in inconsistent quality of grapes, and thus inconsistent wine quality. NARC would like to substantially reengineer the production model to improve the quality of its products. To ensure the effective implementation of the new production model, it also needs a new quality system to monitor and review the production performance of its grapes and wines.

10. At present, NARC through Xixia King Winery sells about 80% of its wine production and commands a 70% market share in wine sales in Ningxia; it has difficulty entering the wine market in other provinces. Even though wine consumption is increasing across the PRC, the number of wineries and wine brands is also increasing. NARC has not yet identified proper marketing strategies to improve its competitiveness and profitability. The project will help NARC improve its capacity by establishing a quality control system, developing a marketing and business strategy, and providing training and consulting services.

11. **Climate change impact.** Vineyard and orchard production are particularly vulnerable to climate change. Temperature increases, rainfall reduction, change in precipitation pattern and seasonal duration, and higher incidence of extreme droughts and floods are affecting the productivity of vineyards and orchards in Ningxia. Weather reports show that (i) the average temperature in Ningxia has risen by 0.8°C since 1960; and (ii) precipitation decreased by about 8.6% from 1960 to 1990, with a recorded increase in drought events. More efficient water use is required to adapt to climate change impacts.

12. **Government and ADB strategy.** The project is consistent with the Twelfth Five-Year Plan, 2011–2015 of the Government of the People's Republic of China, which aims to promote equitable and balanced regional growth, sustainable natural resource management, and crop

diversification.<sup>5</sup> The project particularly follows the State Council's decree on promoting economic and social development of Ningxia.<sup>6</sup> The project supports NHARG's Twelfth Five-Year Plan in accelerating agricultural development by increasing agricultural production capacity, reducing risk, and improving market competitiveness. Both grapes and dates are selected as having the potential to be transformed into high-value crops. The region's 10-year development plan for viticulture promotes innovation in irrigation technology and advocates the use of water-saving irrigation technologies such as drip and sprinkler irrigation systems. The project is in line with the Asian Development Bank (ADB) country partnership strategy, 2011–2015 for the PRC, which supports the government's goal of building a harmonious society by (i) addressing rising income inequality and widening regional disparities, and (ii) promoting environmentally sustainable development.<sup>7</sup> It also supports ADB's Water Operational Plan, 2011–2020 for promoting integrated water resources management and irrigation efficiency.<sup>8</sup>

13. **Lessons.** The project design incorporates lessons from programs and projects of the ADB, the World Bank, and other development partners relating to land and natural resource management in the PRC. The PRC–Global Environment Facility Partnership for Land Degradation in Dryland Ecosystems, which is administered by ADB, helped develop an integrated ecosystem management strategy and action plan for land management in Ningxia, which the project follows to improve the project design.<sup>9</sup> The good practices being implemented under ADB's ongoing Ningxia Integrated Ecosystem and Agricultural Development Project, such as crop residue mulching, minimum tillage, crop rotation, improved pest and quality management, and community participation, were also considered in the project design.<sup>10</sup> The project will use a partnership model of enterprise plus farmer household to improve the value chain; this was tested in ADB's earlier agriculture projects.<sup>11</sup> A project component will strengthen the institutional capacity of the executing and implementing agencies to ensure project success and sustainability.

14. **Demonstration and scale-up.** The project will demonstrate the improvement of irrigation efficiency by using drip irrigation in the project vineyards and date orchards. Irrigation efficiency increase is critical to the sustainability of Ningxia's future agricultural development given its limited water resources. The project will help strengthen the partnership model of enterprises plus farmer households to promote sustainable farming practices and improve the agricultural value chain. The results and experiences from the project will be replicated in NHARG's agricultural development programs, particularly to develop 666,670 ha of vineyards by 2020.

<sup>5</sup> Government of the People's Republic of China, National Development and Reform Commission. 2011. *The Outline of the Twelfth Five-Year Plan, 2011–2015*. Beijing.

<sup>6</sup> Government of the People's Republic of China. 2008. *State Council's Decree on Further Promoting Economic and Social Development of Ningxia*. [http://www.gov.cn/zwgc/2008-09/12/content\\_1094001.htm](http://www.gov.cn/zwgc/2008-09/12/content_1094001.htm)

<sup>7</sup> ADB. 2012. *Country Partnership Strategy: People's Republic of China, 2011–2015*. Manila.

<sup>8</sup> ADB. 2011. *Water Operational Plan, 2011–2020*. Manila.

<sup>9</sup> ADB. 2004. *Financial Arrangement for a Global Environment Facility Grant and ADB Technical Assistance Grant to the People's Republic of China for Capacity Building to Combat Land Degradation Project*. Manila; and ADB. 2001. *Technical Assistance to the People's Republic of China for the People's Republic of China–Global Environment Facility Partnership on Land Degradation in Dryland Ecosystems*. Manila.

<sup>10</sup> ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Administration of Grant to the People's Republic of China for the Ningxia Integrated Ecosystem and Agricultural Development Project*. Manila.

<sup>11</sup> ADB. 2007. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant to the People's Republic of China for the Henan Sustainable Agriculture and Productivity Improvement Project*. Manila; and ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Administration of Grant to the People's Republic of China for the Dryland Sustainable Agriculture Project*. Manila.

## **B. Impact and Outcome**

15. The impact will be improved sustainability of agricultural production in Ningxia. The outcome will be increased quality and value of horticultural crops in Ningxia.

## **C. Outputs**

16. The project will have four outputs: (i) improved irrigation systems, (ii) improved vineyards and Chinese date orchards, (iii) increased grape processing capacity, and (iv) strengthened institutional and farmer capacity.

17. Output 1 will replace the existing irrigation systems with higher efficiency systems on the project sites, and introduce drip irrigation and hose irrigation in the project vineyards and Chinese date orchards. It will support the construction of water storage ponds, small pumps, on-farm water distribution pipe networks, and other relevant facilities.

18. Output 2 will support (i) the rehabilitation of 1,340 ha of existing vineyards and the establishment of 1,260 ha of new vineyards in six farms of Xixia King Industrial Co. Ltd.; (ii) the establishment of 330 ha of vineyards in Hongsipu district; and (iii) the establishment and rehabilitation of 930 ha of irrigated Chinese date orchards in Tongxin and Yanchi counties.<sup>12</sup> It will also support associated land leveling; windbreak shelterbelts; improved farming practices, including pest management and balanced fertilizer application, and conservation tillage; and access roads in the project vineyards and orchards.

19. Output 3 will support Xixia King Winery in establishing about 15,000 tons of in-situ grape processing capacity and a quality monitoring system at each of the two NARC farm sites, with 10,000 tons at the Yuquanying farm and 5,000 tons at the Nuanquan farm. This will include grape crushing, pressing, and juice storage facilities.

20. Output 4 will strengthen institutional capacity of the executing and implementing agencies to implement the project and provide training to farmers on the use of drip irrigation and new farming technologies. About 5,000 farmers will be trained on grape and Chinese date planting; improved vineyard and orchard technology and management; plant disease control and management; and other topics mostly through farmer field schools. It will help NARC to improve monitoring systems for quality control and enhance its marketing and business strategy. It will also support development and strengthening of farmer associations, including water users associations; pilot monitoring of water uses by water users associations; monitoring services including soil testing; and support project management. About 18 person-months of international and 47 person-months of national consulting services will be provided for the training program and capacity development, including introduction of new technologies, and applied research and development.

## **D. Investment and Financing Plans**

21. The project is estimated to cost \$106.40 million (Table 1). The detailed cost estimates are in the project administration manual (PAM).<sup>13</sup>

22. The government has requested a loan of \$70 million from ADB's ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace

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<sup>12</sup> Numbers may not sum precisely because of rounding.

<sup>13</sup> Project Administration Manual (accessible from the list of linked documents in Appendix 2).



period of 5 years; an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility;<sup>14</sup> a commitment charge of 0.15% per year, and such other terms and conditions set forth in the loan and project agreements. The government will make the ADB loan proceeds available to NHARG. NHARG will in turn onlend and/or make available a portion of the loan proceeds to the local governments and NARC. The detailed arrangements are in the PAM (footnote 13).

**Table 1: Project Investment Plan (\$ million)**

<b>Item</b>	<b>Amount<sup>a</sup></b>
<b>A. Base Cost<sup>b</sup></b>	
1. Improved irrigation systems	26.67
2. Improved vineyards and Chinese date orchards	45.13
3. Increased grape processing capacity	12.33
4. Strengthened institutional and farmer capacity	5.92
<b>Subtotal (A)</b>	<b>90.05</b>
<b>B. Contingencies<sup>c</sup></b>	<b>13.74</b>
<b>C. Financing Charges During Implementation<sup>d</sup></b>	<b>2.61</b>
<b>Total (A+B+C)</b>	<b>106.40</b>

<sup>a</sup> Includes taxes and duties of \$1.3 million, of which \$0.9 million will be financed from the loan proceeds.

<sup>b</sup> In 2012 prices.

<sup>c</sup> Physical contingencies were computed at 5% for all items. Price contingencies were computed based on the Asian Development Bank (ADB)-prescribed (international and national) price escalation factors, and includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

<sup>d</sup> Includes interest and commitment charges. Interest during construction for the ADB loan was computed at the 5-year forward London interbank offered rate (LIBOR) plus a spread of 0.4% and maturity premium of 0.1% in accordance with the maturity-based loan pricing. Commitment charges for the ADB loan are computed at 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

23. The financing plan is in Table 2. The ADB loan will finance \$70.00 million, or 65.80% of the total project costs, including civil works, equipment and materials, training and capacity development, and taxes and duties.<sup>15</sup> NARC and the local governments will provide counterpart funds.

**Table 2: Financing Plan**

<b>Source</b>	<b>Amount (\$ million)</b>	<b>Share of Total (%)</b>
Asian Development Bank	70.00	65.80
Local governments of Hongsipu district, and Tongxin and Yanchi counties <sup>a</sup>	9.19	8.60
Ningxia Agricultural Reclamation Group Co., Ltd.	27.21	25.60
<b>Total</b>	<b>106.40</b>	<b>100.00</b>

<sup>a</sup> The Hongsipu district government will finance \$2.33 million; the Tongxin county government, \$4.82 million; and the Yanchi county government, \$2.04 million.

Source: Asian Development Bank estimates.

<sup>14</sup> The interest includes a maturity premium of 0.1%, which is based on the loan terms and the government's choice of repayment option.

<sup>15</sup> The amount of taxes and duties to be financed in the project was determined based on the principles that (i) the taxes and duties financed by the ADB loan, which represent about 1% of the project cost, do not represent an excessive share of the project; (ii) the taxes and duties apply only with respect to ADB-financed expenditures; and (iii) the financing of taxes and duties is material and relevant to the success of the project since the percentage of some financed expenditures needs to be 100%.

## E. Implementation Arrangements

24. NHARG, represented by the Ningxia Finance Department, will be the executing agency for the project. A project leading group, headed by the vice chair of NHARG, will ensure coordination across sectors and guide project preparation and implementation. A provincial project management office (PPMO) has been established to be responsible for daily project coordination of project preparation and implementation. NARC will be the implementing agency for the activities under its jurisdiction, and the governments of the Hongsipu district, and Tongxin and Yanchi counties will be the implementing agencies for subprojects under their jurisdiction. The implementing agencies will set up project implementing offices (PIOs) to carry out day-to-day implementation of their subprojects, procurement, and monitoring and evaluation. The implementation arrangements are summarized in Table 3 and described in detail in the PAM (footnote 13).

**Table 3: Implementation Arrangements**

Aspects	Arrangements		
Implementation period	July 2013–June 2018		
Estimated completion date	30 June 2018		
Management			
(i) Oversight body	The project leading group for foreign debt management of NHARG Chair: vice chair of NHARG Members: the Ningxia Development and Reform Commission; and the departments of agriculture, finance, land management, water resources, and relevant agencies		
(ii) Executing agency	NHARG		
(iii) Key implementing agencies	NARC will be responsible for day-to-day implementation of the activities in its farm sites, including rehabilitating and planting new vineyards with required irrigation infrastructure, establishing the two grape processing facilities, and undertaking training and capacity development.  The Tongxin and Yanchi county governments will take charge of the establishment of Chinese date orchards and related irrigation systems, and undertake training and capacity development in their jurisdictions. The Hongsipu district government will establish vineyards and related irrigation systems, and conduct training activities in the district.		
(iv) Implementation units	Project implementing offices in NARC and the local governments of Hongsipu district, and Tongxin and Yanchi counties. The participating farms under Xixia King Industrial Co. Ltd. will implement activities within six farms. Xixia King Winery will implement the two grape processing facilities under output 3.		
Procurement	International competitive bidding	2 goods contracts	\$3,000,000
	National competitive bidding	About 80 contracts for civil works and goods	\$42,195,000
	Shopping	About 132 contracts for goods and small work	\$18,805,000
Consulting services	International	18 person-months	\$318,000
	National	47 person-months	\$242,000
Retroactive financing and/or advance contracting	NHARG has requested advance contracting and retroactive financing to enable early commencement of procurement of works, office equipment, materials such as seeds; consulting services; and training. Retroactive financing will apply to up to 10% of the total ADB loan amount, with respect to expenditures incurred before loan effectiveness, but not more than 12 months before the signing of the loan agreement. The borrower, NHARG, and the provincial project management office were advised that approval of advance contracting and retroactive financing does not commit ADB to finance the project.		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's <i>Loan Disbursement Handbook</i> (2012, as amended from time to time) and detailed arrangements agreed upon between ADB and the government.		

ADB = Asian Development Bank, NARC = Ningxia Agricultural Reclamation Group Co., Ltd., NHARG = Ningxia Hui Autonomous Region government.

Source: Asian Development Bank.

### III. DUE DILIGENCE

#### A. Technical

25. The achievement of the project's impact and outcome depends on the successful introduction and operation of drip irrigation, adoption of farming technology, and on-farm management. The engineering review indicates drip irrigation is relatively new to Ningxia, and a specialized engineering firm needs to be engaged for detailed design, particularly to properly deal with the high silt content in water from the Yellow River. A properly designed system with silt traps, reservoirs, filters, system maintenance and cleaning, and training on system maintenance are necessary. The technical assessment suggests that farm management practices are critical to the quality of produce. To improve grape quality, monitoring of vine and fruit growth through rigorous data collection and recordkeeping of vineyard operations, such as irrigation schedules, plant disease prevention measures, and pesticide application, are needed. The project has allocated budget for the technical design, consulting services, and farmer training in these areas.

#### B. Economic and Financial

26. The economic analysis of the project used with- and without-project scenarios following ADB's *Guidelines for the Economic Analysis of Projects*.<sup>16</sup> The analysis confirms the economic viability of the project and each individual activity. The economic internal rate of return for the overall project is estimated at 17.4%, and for individual project activities from 12.1% to 23.8%. Sensitivity analysis examined the robustness of economic viability of the project and individual activities under three scenarios: benefit decline, capital cost increase, and operation and maintenance cost increase. While the economic viability of the whole project and most activities is quite robust, the date monoculture in Yanchi county and vineyard rehabilitation in NARC can be susceptible to a substantial benefit shortfall, and/or a substantial capital cost, and/or operation and maintenance cost increase. The financial analysis assessed the financial internal rate of return for the whole project as 15.2% and for the individual project activities as 9.2%–34.7%; all are well above the weighted average cost of capital of 2.77%. Hence, the project and the individual project activities are confirmed financially viable.

#### C. Governance

27. The institutional and capacity development analysis found that NHARG has experience in implementing ADB- and other development partner-financed projects. The financial management assessment shows that (i) the executing and implementing agencies are capable of carrying out satisfactory accounting and financial reporting for the project, and (ii) internal control and audit are generally acceptable. The procurement capacity assessment indicates that (i) established arrangements are in place in Ningxia to handle various stages of procurement, (ii) the executing and implementing agencies have experience in undertaking procurement under ADB- or domestically financed projects, and (iii) monitoring and internal controls regarding procurement are generally in place. NARC has adequate capacity and experience to implement the project. However, the other three implementing agencies—the governments of Hongsipu district, and Tongxin and Yanchi counties—have little experience with ADB projects. Considering their limited experience, training on ADB procedures for financial management, procurement, disbursement, and safeguards will be provided during implementation.

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<sup>16</sup> ADB. 1997. *Guidelines for the Economic Analysis of Projects*. Manila.

28. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with NHARG and the government. The specific policy requirements and supplementary measures are described in the PAM (footnote 13).

#### **D. Poverty and Social**

29. The project will benefit more than 12,400 farmers (about 3,200 households) by increasing their access to capacity development and improved agricultural technologies to stabilize their livelihoods and increase their incomes. In the project counties, the poverty rate is above 35%—much higher than the provincial average of around 25.6% and the national average of around 10%. Among the project beneficiaries, 487 households with 2,289 members are recognized as rural poor households living under the national poverty line of CNY2,300. The beneficiaries, particularly poor households with limited access to diversified income, will reap long-term benefits from higher, more predictable, and more stable agricultural income by growing higher-quality grapes or Chinese dates. The farmers will participate voluntarily and the sustainability of the benefits will be ensured through capacity building for farmers and empowerment of farmer associations. The farmers involved in grape production and Xixia King Winery will enter into production agreements before any planting activities begin and following an extensive consultation process. Community participation and social responsiveness of the project activities are mainstreamed in the project design through consultation processes and included in the social action plan.

30. **Gender.** A gender analysis was carried out during project preparation. The project is categorized as effective gender mainstreaming and contains design features to support advancing gender equality. The main gender issues in rural PRC and in the project area are underrepresentation of women in decision making; women's limited access to capacity development activities; and, thus, reduced opportunities for better employment. Women's workloads are increasing because they remain on the farm, while many men and young people go elsewhere for better job opportunities. The gender action plan identifies activities, implementation responsibilities, and expected benefits from these activities.<sup>17</sup> The plan will benefit and empower women; and work toward gender equality by (i) improving women's participation in decision-making processes, (ii) increasing capacity development for women, and (iii) increasing opportunities for employment.

#### **E. Safeguards**

31. **Environment.** The project is classified as category B for environment. An initial environmental examination and an environmental management plan (EMP) were prepared and are consistent with ADB's Safeguard Policy Statement (2009) requirements. The initial environmental examination incorporates the results of the domestic environmental assessment report approved in May 2012 by the Ningxia Environmental Protection Department. Adequate consultations were conducted with key stakeholders, including local government agencies and communities. The conclusions and recommendations of the assessment were integrated in the project design. NHARG, through the PPMO and PIOs, will be responsible for EMP implementation, including monitoring, mitigation, reporting, and corrective actions or measures. The PPMO and PIOs will have final responsibility for handling any disputes within the grievance redress mechanism. The institutional capacity of the implementing agencies to implement the EMP and ensure compliance with ADB's Safeguard Policy Statement is weak. A capacity development program is included in the project activities.

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<sup>17</sup> Gender Action Plan (accessible from the list of linked documents in Appendix 2).

32. The project is expected to achieve environmental benefits, specifically better water use efficiency in the project area; and soil stabilization and reduced erosion resulting from establishment of shelterbelts. No major adverse impacts were identified. Construction and rehabilitation works are small and relatively simple. Operating risks include expanded use of agricultural chemicals, elevated chemicals in soils, and increased risk of workers' exposure of chemicals. Most project sites are located on modified lands used for agriculture and have been cleared of natural habitats. No ecologically sensitive sites are present in the project area. Wastewater from grape processing facilities will be treated and reused for crop irrigation, and will not be discharged into channels leading to natural waterways. Shelterbelts established by the project will utilize a mix of native and long-established tree and shrub species. Training programs will include topics on safe application of agricultural chemicals and methods to reduce application rates. Implementation of the EMP and the environmental monitoring program is expected to prevent or minimize potential impacts.

33. **Indigenous peoples.** The project is classified as category B for indigenous peoples. The requirements of ADB's Safeguard Policy Statement for safeguarding indigenous peoples will apply to the project as (i) the Hui people have both distinctiveness and vulnerability as described by ADB's Safeguard Policy Statement; and (ii) the project will impact on their farming practices and may consequently alter their socioeconomic status, including expenditure patterns, though principally in a positive way. Among the project beneficiaries are 570 households, with almost 3,000 people of the Hui ethnic minority, concentrated in two participating villages. Poverty and vulnerability rates are higher for Hui households than for Han households. In terms of poverty incidence, more Hui households (32%) are considered low income compared with Han households (16%). The higher poverty is in part due to former relocation as part of a government program, but also to lack of access to improved farming techniques. As potential project beneficiaries, concerns of ethnic minorities are addressed as part of the project design; and the executing and implementing agencies prepared an ethnic minority development plan to ensure that participating minorities will receive social and economic benefits that are culturally appropriate and gender responsive. The plan will be finalized once the production or participation agreements with farmers are finalized.

34. **Resettlement.** The project is classified as category C for involuntary resettlement. No involuntary loss of land, housing, or access to income-generating assets is necessary for the project. Most of the activities are going to be implemented on state farms with clear government land ownership. In the participating villages, construction activities will be limited to small-scale infrastructure linked to improved irrigation, such as water retention ponds, irrigation pipes, and farm access roads. These will be constructed on village land that is not being used for agricultural or other income-generating activities, and ownership of the infrastructure will remain with the villages. Participation and contribution of land to the planting schemes will be on a voluntary basis; this will be formalized through the production or participation agreements and monitored by the PIOs.

## **F. Risks and Mitigating Measures**

35. The project has some potential technical, financial, implementation, and institutional risks. The project provides adequate measures and/or assurances to minimize these risks, and the integrated benefits and impacts are expected to outweigh the costs. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.<sup>18</sup>

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<sup>18</sup> Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

**Table 4: Summary of Risks and Mitigating Measures**

<b>Risks</b>	<b>Mitigating Measures</b>
Drip irrigation systems do not work to standards.	The implementing agencies will (i) recruit qualified and specialized engineering firms for technical design of the drip irrigation systems, (ii) recruit consultants to help monitor project design and implementation, (iii) provide adequate training for farmers to operate and maintain the system, and (iv) empower water users associations to take over drip irrigation system operation and maintenance.
Grape farmers fail to produce high-quality grapes for the Ningxia Agricultural Reclamation Group Co., Ltd. (NARC).	NARC will contract international vineyard and other expertise to help improve the production regime. The project will help establish a production agreement between grape growers and NARC that provides for an incentive for farmers to produce high-quality grapes rather than focus purely on high yield.

Source: Asian Development Bank.

#### **IV. ASSURANCES AND CONDITIONS**

36. The government and NHARG have assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM (footnote 13) and loan documents.

37. The government and NHARG have agreed with ADB on certain covenants for the project, which are set forth in the loan and project agreements.

38. No withdrawals shall be made from the loan account until the onlending agreement between NHARG and NARC, in the form and substance satisfactory to ADB, shall have been duly executed and delivered; and shall have become fully effective and binding in accordance with its terms provided in the loan and project agreements.

#### **V. RECOMMENDATION**

39. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of \$70,000,000 to the People's Republic of China for the Ningxia Irrigated Agriculture and Water Conservation Demonstration Project, from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Haruhiko Kuroda  
President

22 November 2012

## DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p><b>Impact</b> Improved sustainability of agricultural production in Ningxia</p>	<p>Percentage of land under water conservation irrigation, including drip and sprinkler irrigation, to total irrigated land increased from 50% in 2010 to 80% by 2022</p> <p>Average per capita rural income increased from CNY4,675 in 2010 to CNY9,000 by 2022 in real terms</p> <p>Ratio of EBIT and revenue of the NARC vineyard and winery operations (Xixia King Industrial Co. Ltd.) reached at least 80% by 2022</p>	<p>NHARG and county yearbooks, and socioeconomic development plans and evaluation reports</p> <p>Project review missions, and completion and evaluation reports</p> <p>Provincial review of the progress of NHARG's 12th and 13th five-year plans</p>	<p><b>Assumption</b> The government continues its efforts to promote sustainable development and increase farmer incomes.</p>
<p><b>Outcome</b> Increased quality and value of horticultural crops in Ningxia</p>	<p>90% of grapes produced by the project met the quality standard prescribed by quality winery<sup>a</sup> in Ningxia by 2018 (baseline: 0% in 2011)</p> <p>Grape production by the project increased from 670 tons in 2011 to 2,200 tons by 2018</p> <p>Chinese dates production by the project increased to 1,810 tons by 2018 (baseline: 0 ton in 2011)</p>	<p>NHARG and county yearbooks and reports</p> <p>Project progress and monitoring reports</p> <p>NARC reports</p> <p>Project review missions, and completion and evaluation reports</p>	<p><b>Assumptions</b> Price–quality incentives encourage adoption of high-quality crops.</p> <p>Favorable wine market price and growth of wine consumption continue.</p> <p><b>Risks</b> The institutional capacity of the implementing agencies is weak.</p> <p>Farmers fail to apply new technology to achieve high-quality crop production.</p>
<p><b>Outputs</b></p> <p>1. Improved irrigation systems</p> <p>2. Improved vineyards and Chinese date orchards</p>	<p>By 2018: Water-efficient drip and hose irrigation installed in all project vineyards and orchards</p> <p>Total irrigated area increased by 2,520 ha</p> <p>Annual irrigation water savings of about 3 million m<sup>3</sup> from 18.6 million m<sup>3</sup> in 2010</p> <p>1,260 ha of new vineyards established under NARC</p> <p>1,340 ha of existing vineyards rehabilitated under NARC</p>	<p>Project progress reports</p> <p>Contractual payment records</p> <p>NHARG and county agricultural statistics</p> <p>Project review missions, and completion and evaluation reports</p> <p>Project progress reports</p> <p>Contractual payment records</p> <p>NHARG and county agricultural statistics</p>	<p><b>Risks</b> Drip irrigation systems do not work to standards.</p> <p>Farmers cannot afford to apply drip irrigation.</p> <p><b>Assumption</b> Effective monitoring is in place to ensure the implementing agencies and farmers adopt high-quality and sustainable production.</p>

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>3. Increased grape processing capacity</p> <p>4. Strengthened institutional and farmer capacity</p>	<p>By 2018:</p> <p>About 330 ha of new vineyards developed in Hongsipu district</p> <p>About 930 ha of Chinese dates planted in Tongxin and Yanchi counties</p> <p>About 280 ha of shelterbelts established</p> <p>About 40% of jobs created under the project filled by women</p> <p>About 15,000 tons of grape processing capacity constructed</p> <p>About 5,000 farmers trained in water and soil conservation, sustainable horticultural management, and plant disease prevention and pesticide management</p> <p>About 40 staff from the PPMO and PIOs trained in project management, procurement, financial management, and disbursement</p> <p>About 300 staff from cooperatives and the WUAs trained in sustainable horticultural management</p> <p>A marketing and business strategy for the NARC developed and implemented</p> <p>Wine sales outside Ningxia by NARC increased from 20% in 2010 to 30%</p> <p>At least 40% of trainees on horticultural management are women.</p>	<p>Project review missions, and completion and evaluation reports</p> <p>Project progress reports</p> <p>Project review missions, and completion and evaluation reports</p> <p>Project progress reports</p> <p>Project review missions, and completion and evaluation reports</p> <p>Training programs</p>	<p><b>Risks</b></p> <p>Grape farmers fail to produce high-quality grapes.</p> <p>Farmers over apply fertilizer and agricultural chemicals.</p> <p>Major plant diseases may affect grape and date production.</p> <p><b>Assumption</b></p> <p>NARC has adequate capacity for managing and operating the facilities.</p> <p><b>Assumption</b></p> <p>NHARG and counties maintain dedicated PPMO staff at required number and qualifications.</p> <p><b>Risk</b></p> <p>Farmer associations do not function as expected.</p>



Activities with Milestones	Inputs (\$ million)
<b>1. Improved irrigation systems</b>	ADB: 70.00
1.1 Complete technical design for drip irrigation systems by March 2013	
1.2 Advertise procurement opportunities for irrigation works and award contracts to constructors during 2013–2015	Local governments: 9.19
1.3 Construct drip irrigation systems, including water storage, delivery systems, and on-farm irrigation facilities, during 2013–2017	NARC: 27.21
1.4 Conduct tests and commission the drip irrigation systems during 2014–2018	
1.5 Hand over the operation and maintenance of the drip irrigation systems to the WUAs during 2014–2018	<b>Total: 106.40</b>
<b>2. Improved vineyards and Chinese date orchards</b>	
2.1 Complete technical design of the project by March 2013	
2.2 Negotiate and finalize agreements between farmers and implementing agencies by March 2013	
2.3 Improve the existing vineyards during 2013–2016	
2.4 Establish new vineyards and plant grapes during 2013–2017	
2.5 Establish new Chinese date orchards during 2013–2017	
2.6 Implement pest management measures from 2013 onward	
2.7 Conduct on-farm management and maintenance of crops planted during 2013–2018	
2.8 Establish windbreak forest belts around farmlands by 2018	
<b>3. Increased grape processing capacity</b>	
3.1 Complete technical design of the grape processing facilities by March 2013	
3.2 Construct the buildings for two grape processing units during 2014–2016	
3.3 Procure and install the processing equipment from 2014 onward	
3.4 Conduct tests and commission the processing facilities during 2015–2016	
<b>4. Strengthened institutional and farmer capacity</b>	
4.1 Develop and implement training programs for project staff and farmers, including farmer field schools, during 2013–2018	
4.2 Conduct monitoring and supervision activities from 2013 onward	
4.3 Provide assistance for establishment of farmer associations, including the WUAs, from 2013 onward	
4.4 Implement programs for pilot monitoring of water uses by the WUAs from 2013 onward	
4.5 Develop and implement NARC's wine marketing strategy from 2014 onward	
4.6 Implement the ethnic minority development plan, the gender action plan, the social action plan, and the communication strategy during 2013–2018	
4.7 Implement actions and measures of the environmental management plan during 2013–2018	

ADB = Asian Development Bank; EBIT = earnings before interest and tax; ha = hectare; m<sup>3</sup> = cubic meter; NARC = Ningxia Agricultural Reclamation Group Co., Ltd.; NHARG = Ningxia Hui Autonomous Region government; PIO = project implementing office; PPMO = provincial project management office; WUA = water users association.

<sup>a</sup> The criteria of the quality winery standard is included in the Project Administration Manual (accessible from the list of linked documents in Appendix 2).

Source: Asian Development Bank.

**LIST OF LINKED DOCUMENTS**

<http://www.adb.org/Documents/RRPs/?id=44035-014-3>

1. Loan Agreement
2. Project Agreement
3. Sector Assessment (Summary): Agriculture and Natural Resources
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Economic and Financial Analysis
8. Country Economic Indicators
9. Summary Poverty Reduction and Social Strategy
10. Gender Action Plan
11. Initial Environmental Examination
12. Indigenous Peoples Plan: Ethnic Minority Development Plan
13. Risk Assessment and Risk Management Plan