SECTOR ASSESSMENT (SUMMARY): AGRICULTURE AND NATURAL RESOURCES

Sector Road Map

1. Sector Performance, Problems, and Opportunities

   1. The People’s Republic of China (PRC) has a vast territory spanning five major climatic zones running from north to south, and with thousands of different species of crops and livestock under production. In 2011, the rural population was 656 million, with some 405 million farmers in the rural labor force. Although agricultural production has been increasing and the rural economy has developed rapidly, the share of agriculture in national income has been declining, and rural areas are losing young and skilled laborers.

   2. The PRC’s natural resource base is under threat from inefficient use, weak institutional management, and inadequate protection. Given constraints on arable land and water resources, their utilization and management must be improved such that natural resources can be preserved and agricultural productivity and rural livelihoods improved. The PRC has 19.3% of the world’s population, but only about 5% of its freshwater. Considerable soil contamination and water pollution is anticipated if existing patterns of free-range livestock grazing and untreated disposal of animal waste continue. This translates into fierce competition for water with a weak framework governing water rights.

   3. The key to better rural livelihoods lies in higher agricultural productivity and enhanced rural environmental and social services. In many parts of rural PRC, low rainfall, high evaporation, frequent natural disasters, and soil erosion lead to low productivity and instability in agricultural production. In the interior regions, the nature of extensive and scattered small-scale agriculture has not changed significantly in decades. Most farmers continue to practice traditional agriculture that generates low incomes and requires extensive use of water and agrochemicals. Such low-productivity agricultural systems are unsustainable and damaging to the environment, and trap many farmers in poverty. In addition, lack of investment in rural public goods, such as environmental facilities, health services, and social safety nets, has prevented the rural population from enjoying a higher quality of life.

   4. Horticultural development in Ningxia. Located in the northwest region, Ningxia 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 or 36% are Hui minority. Ningxia is largely arid and semiarid, with dry and harsh winters and hot summers. Agriculture remains an important sector. 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 farming 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 of vineyards by 2020. The Ningxia Agricultural Reclamation Group Co., Ltd. (NARC), a state-owned enterprise, will play a key role in achieving

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this target. For Chinese dates, Tongxin and Yanchi counties have planned to improve the quality of this traditional crop while expanding the crop area. The improvement of productivity and quality of horticultural crops will result in increased incomes for crop growers.

5. 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 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.

6. 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.

7. **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 in the 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.

8. **Marketing and business strategy.** NARC and Hongsipu district face challenges to create a viable and sustainable vineyard and winery business. 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.

9. At present, NARC 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. As a commercialized state-owned enterprise, 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.

10. **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.
11. Opportunities exist to increase the production of high-quality and high-value crops, and improve water use efficiency and farming technology. The project will demonstrate water conservation measures that are useful in Ningxia and in other dry areas. The project will also help farmers to change to more sustainable farming practices.

2. **Government’s Sector Strategy**

12. New policies in recent years include the new Socialist Countryside Development, harmonization of development between urban and rural areas, and promotion of western region development. Within these broad thrusts, the PRC government has improved the legal and regulatory setting, and strengthened enforcement of environmental laws and regulations to improve the sustainability of rural production systems. The PRC government has been supporting a range of market-oriented agricultural reforms aimed at increasing productivity and rural livelihoods.

13. The PRC government’s rural focus under the Twelfth Five-Year Plan, 2011–2015 aims to increase emphasis on resource-conserving and environment-friendly development; and more sustainable use and management of land, water, and natural resources. The plan expresses particular concerns about the (i) degradation of the natural resource base; (ii) pollution of water bodies; (iii) deterioration of soils, forest areas, and biodiversity; (iv) weak rural infrastructure; and (v) relatively low rural incomes and livelihoods. Water resources management has been accorded increasing priority over time. The PRC’s new programs will focus on (i) flood control for numerous small and medium-sized rivers (within the eight major river basins) in the western region; (ii) safe drinking water; and (iii) rural irrigation, including sustainable groundwater use and drainage infrastructure rehabilitation. In the area of rural land use and improving soil quality, programs will focus on (i) modern technology promotion for high-value production and processing systems, (ii) low-carbon agriculture in self-contained and circular systems that make use of all by-products and wastes, (iii) farmer training and off-farm job creation, and (iv) water and soil conservation.

14. The State Council has issued a decree to promote economic and social development of Ningxia (part of an integrated package to support relatively underdeveloped western provinces). NHARG’s Twelfth Five-Year Plan aims to accelerate agricultural development by increasing agricultural production capacity, reducing risk, and improving market competitiveness. Both grapes and dates are selected as crops that have potential to be transformed into high-value ones. The 10-year development plan for Ningxia viticulture promotes innovation in irrigation technology, and advocates the use of water-saving irrigation technologies such as drip and sprinkler irrigation systems.

3. **ADB Sector Experience and Assistance Program**

15. In recent years, environmental sustainability has been promoted through projects supporting ecosystem management and biodiversity conservation, sustainable natural resource use and conservation, and irrigation and water conservation. These have contributed to inclusive growth by improving farming practices and linking local entrepreneurs with poor farmers through extension services and distribution networks.

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16. Lessons from Asian Development Bank- (ADB) and World Bank-supported agricultural development projects include (i) encouraging stakeholder involvement and community participation in project planning and implementation; (ii) providing support to the project management office leading to strong ownership, which is important for effective project implementation; (iii) ensuring timely and adequate provision of counterpart funds and staff resources by provincial and local governments to avoid implementation delays; (iv) formulating a strong project leading group for guidance; (v) adopting a flexible approach in selecting detailed project interventions during implementation; (vi) ensuring the proper administration of bidding processes following agreed procedures; (vii) increasing farmer incomes by introducing value-added production and marketing; (viii) promoting sustainable farming techniques, particularly on marginal lands; (ix) developing capacity by supporting services to facilitate the adoption of new technologies and practices, particularly among small-scale and poor farmers; and (x) establishing an effective and robust project performance management system at an early stage to ensure the collection of adequate information required for timely corrective measures.

17. The People’s Republic of China–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. 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. 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. A project component will strengthen the institutional capacity of the executing and implementing agencies to ensure project success and sustainability.

18. ADB’s country partnership strategy, 2011–2015 for the PRC will support 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. In line with the PRC government’s goals and objectives, ADB will assist the government in identifying and applying sustainable natural resource use models in lesser-developed regions of the country to improve rural livelihoods, combat poverty, improve the well-being and involvement of women and ethnic minorities, adapt to climate change, and enhance environmental sustainability.

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Problem Tree

Unsustainable agricultural production

Unsustainable agricultural production

Low income and poverty

Low income and poverty

Low quality and value of horticulture crops

Low quality and value of horticulture crops

Insufficient water use

Insufficient water use

Low technology cropping systems

Low technology cropping systems

Inadequate marketing strategy

Inadequate marketing strategy

Flood irrigation widely used with limited use of water conservation technologies

Flood irrigation widely used with limited use of water conservation technologies

Poor maintenance of irrigation systems

Poor maintenance of irrigation systems

Frequent droughts and disasters

Frequent droughts and disasters

Poor on-farm management

Poor on-farm management

Low and/or declining soil quality

Low and/or declining soil quality

Focused on production expansion rather than on quality

Focused on production expansion rather than on quality

Poor links between markets, enterprises, and crop growers

Poor links between markets, enterprises, and crop growers

Limited sales outside Ningxia

Limited sales outside Ningxia

Lack of incentives for farmers to conserve water

Lack of incentives for farmers to conserve water

Weak water delivery service and lack of farmer participation

Weak water delivery service and lack of farmer participation

Climate change impacts

Climate change impacts

Limited managerial capacity and inadequate incentives for farmers

Limited managerial capacity and inadequate incentives for farmers

Low and/or declining organic matter and poor fertilizer use

Low and/or declining organic matter and poor fertilizer use

Low-quality seedlings and varieties

Low-quality seedlings and varieties

Lack of incentives for farmers to grow high-quality crops

Lack of incentives for farmers to grow high-quality crops

Inadequate marketing capacity and skills

Inadequate marketing capacity and skills

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<th>Outcomes with ADB Contributions</th>
<th>Indicators with Targets and Baselines</th>
<th>Outputs with ADB Contributions</th>
<th>Indicators with Incremental Targets</th>
<th>Planned and Ongoing ADB Interventions</th>
<th>Main Outputs Expected from ADB Interventions</th>
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<tr>
<td>Increased agricultural productivity, and improved quality and quantity of natural resources</td>
<td>Grain production increased to 550 million tons in 2020 from 531 million tons in 2009</td>
<td>Agricultural and natural resource-related infrastructure and system expanded, improved, and well managed</td>
<td>Area with efficient irrigation increased by 3.3 million hectares (ha)</td>
<td>Planned key activity areas:</td>
<td>Planned projects (2012–2015):</td>
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<td>Irrigation efficiency improved to 53% in 2015 from 50% in 2010</td>
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<td>2,721 large- and medium-sized reservoirs strengthened and more than 46,000 small-scale reservoirs in danger improved</td>
<td>Water resources management and flood protection (62% of lending)</td>
<td>Area with efficient irrigation increased by 197,700 ha</td>
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<td>Pollution in freshwater bodies reduced by 8% in 2015 from 12.7 billion chemical oxygen demand units in 2010</td>
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<td>Access to safe drinking water increased for 102 million rural residents</td>
<td>Land, forestry, and biodiversity (10% of lending)</td>
<td>Access to safe drinking water increased</td>
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<td>Forest coverage increased to 21.7% in 2015 from 20.4% in 2008</td>
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<td>10 million ha of low- and medium-yield farmland improved and 26.7 million ha of new high-standard farmland developed</td>
<td>Rural infrastructure, agriculture, and biomass (28% of lending)</td>
<td>Productivity of 16,000 ha of agricultural land improved</td>
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<td>Wastewater treatment pipes and sewage network increased by 160,000 kilometers (km)</td>
<td>Wastewater treatment area increased by 30 million ha</td>
<td>Planned projects (2012–2015) (total $1.05 billion):</td>
<td>About 850 km of wastewater treatment pipes constructed</td>
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<td>Daily wastewater treatment capacity increased by 420 million tons</td>
<td>Afforestation area increased by 30 million ha</td>
<td>Water resources management and flood protection: 4 projects ($600 million)</td>
<td>Capacity to collect and treat about 700,000 tons/day of wastewater</td>
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<td>Land, forestry, and biodiversity: 1 project ($100 million)</td>
<td>Aforestation of 2,000 ha</td>
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<td>Rural infrastructure, agriculture, and biomass: 2 projects ($270 million)</td>
<td>Ongoing projects:</td>
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<td>Value chain and product safety: 1 project ($80 million)</td>
<td>Area of irrigated land increased by 32,718 ha</td>
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<td>Ongoing projects:</td>
<td>2 large-, 10 medium-, and 33 small-scale reservoirs rehabilitated</td>
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<td>Household access to drinking water increased, benefiting 240,000 people</td>
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<td>Productivity of 31,283 ha of farmland improved</td>
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<td>Production capacity of 120,000 ha of farmland improved</td>
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<td>100 km of wastewater treatment pipes and sewage network constructed</td>
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<td>29,460 tons/day of wastewater collected and treated</td>
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<td>111,800 ha afforested</td>
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