

SECTOR ASSESSMENT (SUMMARY): AGRICULTURE AND NATURAL RESOURCES¹

A. Overview

1. In fiscal year (FY) 2011, agriculture contributed 34% of Nepal's gross domestic product (GDP), or \$5.2 billion. Agriculture production was 46% from cereals; 24% from livestock (and dairy); and 23% from fruit, spices, and vegetables. Agriculture in Nepal is characterized by low productivity, with the 2010 average cereal yield only 60.1% of the Bangladesh average for the same year.² Agriculture is based on low-value crops (such as cereals) and subsistence production, with only about 43% of agricultural households trading their products in markets. Nevertheless, agriculture continues to employ 74% of the work force, including a larger proportion of women (86%) than men (52%) and a larger proportion of workers from marginalized socioeconomic groups than from other groups.³ Rugged terrain, the concentration of rainfall in the monsoon months, weak extension services, and limited rural infrastructure constrain sector development. High rural poverty and the impact of climate change are resulting in natural resource degradation, increased disaster risks, and low productivity. The sector's strengths include large land and biological resources, the geographical and climatic diversity to grow a range of crops, and sufficient water resources.

2. Nepal has average annual rainfall of about 1,700 millimeters but about 80% of this is received during the June–September monsoon, leading to highly seasonal river flows. Because Nepal lacks the necessary infrastructure to store water, much of this precipitation is lost through flood flows during the monsoon, leading to acute shortages and the need for efficient and equitable sharing in the dry season. Groundwater extraction is about 12 cubic kilometers (km) per annum and is underutilized in the Terai, the country's lowland plain region. The erratic monsoon climate and largely hilly and mountainous terrain also make Nepal vulnerable to water-induced disasters. The situation is expected to be exacerbated by climate change, with increased rainfall intensity during the monsoon and a likely prolongation of the dry season.

3. Competition for and uncontrolled use of water in Nepal's river basins is having an increasingly negative impact on the country's sustainable development. In the absence of adequate water management systems at the national and basin levels, water resources are being developed without regard to the circumstances and needs of other sectors. This leads to inefficient investments and increased water insecurity. Nepal has a draft integrated water resources management (IWRM) policy but needs support to operationalize it, including help in creating appropriate institutional and legal arrangements.

4. Of the 2.64 million hectares (ha) of arable land in the country, 1.80 million ha is irrigable and about 1.25 million ha is provided with basic irrigation. Farmers with large land holdings benefit from state-financed irrigation projects. Smallholders, rural women, and the poor benefit from community-managed irrigation systems and micro irrigation systems. Irrigation efficiency is estimated at 35%, and water productivity is low. As irrigation water has been traditionally provided free of any significant charge, overuse is common. Institutional reforms are needed to improve water use through better operation and maintenance, improved water distribution and efficiency by rehabilitating and modernizing infrastructure, the scaling up of water conservation

¹ This summary is based on *Technical Assistance to Nepal for Preparation of the Nepal Agricultural Development Strategy* (TA 7762-NEP). It covers four subsectors: (i) agriculture and rural sector development; (ii) water-based natural resource management; (iii) land-based natural resource management; and (iv) irrigation, drainage, and flood control.

² Government's fiscal year (FY) ends on 15 July. FY before a calendar year denotes the year in which the FY ends.

³ Government of Nepal, Central Bureau of Statistics; United National Development Programme; and International Labour Organization. 2009. *Report on the Nepal Labor Force Survey 2008*. Kathmandu.

irrigation technologies, the upgrading of farming technologies, and the provision of marketing and knowledge to smallholder farmers.

5. To ensure maximum social and economic value is extracted from water, storage development needs to be considered in the broader context of the competing needs of the hydropower energy subsector. Water storage is critical for (i) ensuring year-round irrigation, (ii) meeting hydroelectricity demand in the lean season, and (iii) flood control. However, the development of storage dams for these purposes has proven difficult due to limited capacity to manage land acquisition and resettlement challenges and lack of finance. Some limited attention has been given to enhancing and managing natural storage (e.g., wetlands, soil moisture, and aquifers) and the development of small storage structures (e.g., terraced paddies and retention ponds). The government is also assessing the potential for interbasin transfer schemes to support irrigation in the Terai.

6. Rural road networks are the major modes for transporting agriculture inputs and outputs to and from farms, respectively. As of 2011, an estimated 51% of the population lived within 30 minutes' walking distance of a paved road, and 80% were within 30 minutes' walk of a dirt road that could be used by motor vehicles.⁴ With a road density of 14 km per 100 square kilometers of land area, however, Nepal's road density is the lowest in South Asia, constraining marketing of agriculture outputs.⁵

7. The agriculture sector needs to improve productivity, expand commercialization, increase competitiveness, and enhance inclusive governance to include women and other socially-excluded groups in decision making. Reforms are needed to (i) address issues of land use management; (ii) strengthen the commercial regulatory environment for cooperative farming, contract farming, leasing, public-private partnerships, and access to agricultural finance; (iii) improve skills, practices, and technology adoption through reform of research, extension, and agricultural work force education; and (iv) address specific issues of greater equality and access to opportunities for women, the poor, and socially excluded groups.

B. Government's Sector Strategy

8. The government's strategic direction in the sector has been based on the Agriculture Perspective Plan (1996–2015), which focused on broad-based and equitable agricultural growth to have direct and indirect impacts on poverty through gender and socially inclusive access to agricultural infrastructure, inputs, and technology.

9. A new Agriculture Development Strategy (ADS), 2014–2034, was formulated in 2013. It reflects the changed context and emerging issues in the sector, including rural outmigration, urbanization, food security, climate change, and regional and global trade. There is a consensus among the government, farmers, development partners, and other stakeholders, around the ADS vision of “a competitive, sustainable, and inclusive agricultural sector that contributes to economic growth, improved livelihoods, and food and nutrition security.” The strategy envisages the transformation of Nepalese society from one based on primary agriculture to one that derives most of its income from services and industry, including agribusiness. The ADS vision sets short-term (5-year), medium-term (10-year), and long-term (20-year) targets. Short-term targets for 2019 include increased competitiveness, represented by an agricultural trade

⁴ Government of Nepal, Central Bureau of Statistics. 2011. *Nepal Living Standards Survey 2010/11, Statistical Report Volume 1*. Kathmandu.

⁵ World Bank. World Development Indicators. <http://data.worldbank.org/data-catalog/world-development-indicators> (accessed 15 July 213).

balance reduction of 11% from the \$350 million deficit in 2010; improved sustainability, through a reduction of degraded land of 10% to 2.88 million ha from 3.2 million ha in 2010; more inclusiveness, to be indicated by an increase in ownership of land by women or joint land ownership with men to 15% from 10% in 2010; high growth, through an increase in average annual agricultural output to 4% of GDP from 3% in 2010; improved livelihoods, to be achieved by increasing agriculture GDP per capita⁶ to \$979 from \$794 in 2010; and better food and nutrition security, to be indicated by a reduction of the rate of stunting in children below 5 years old to 29% from 41% in 2010. The ADS builds on the Water Resources Strategy (2002), the National Water Plan (2005), and the Irrigation Policy (2003). It puts appropriate emphasis on the provision of year-round irrigation services to increase the productivity of irrigated agriculture and extend the cropping seasons; the importance of a service-oriented management approach to provide more efficient, reliable, and flexible water services to farmers; and the progressive shifting of operation and maintenance costs to water users to enhance efficiency, equity, and sustainability. Key ADS strategies, approaches, programs, and targets are reflected in the government's Approach Paper to the Three Year Plan (FY2014–FY2016).

10. The Irrigation Policy was updated in July 2013. The National Water Plan provides a reasonable framework to put IWRM into operation through key actions, including (i) preparation of an integrated water resources policy; (ii) amendment of the Water Resources Act, with introduction of water use allocation and entitlement systems; (iii) restructuring and strengthening of the Water and Energy Commission Secretariat, including awarding it powers to clear projects; (iv) establishment of river basin organizations; (v) preparation of basin plans; and (vi) strengthening of the water resources information and decision support systems.

11. A Gender and Environment Strategy (2006) and a separate Gender Equality and Environment Division exist at the Ministry of Agriculture Development. However, interventions to date have focused on meeting practical and immediate needs of women and disadvantaged groups rather than on addressing the structural causes of discrimination.

C. ADB Sector Experience and Assistance Program

12. The Asian Development Bank (ADB) has been the main development partner in the sector and began its engagement in the irrigation subsector in 1971.⁷ Total investments so far exceed \$250 million. Under the country partnership strategy (CPS) for 2010–2012 ADB provided support for (i) enhancing agricultural productivity through irrigation; (ii) crop diversification and commercialization; (iii) improving access to agricultural inputs and markets through investments in expansion of rural transport infrastructure; and (iv) policy formulation, including development of the ADS.

13. During the new CPS period (2013–2017), ADB will support investments in (i) water management to expand irrigation, mitigate risks of flooding, and improve watershed management; and (ii) explore innovative investment modalities for expanding the rural road networks. This approach is consistent with the recommendations of a review of ADB's performance in Nepal's agriculture and natural resources sector by ADB's Independent Evaluation Department in 2011, which recommended that ADB should (i) reduce subsector spread and focus on the priority areas; and (ii) increase investment in rural infrastructure such

⁶ Calculated as agricultural GDP per agricultural laborer.

⁷ Other development partners active in the sector are Danish International Development Agency, the European Union, the Food and Agriculture Organization, the Japan International Cooperation Agency, the United Kingdom's Department for International Development, the United States Agency for International Development, the World Food Programme, and World Bank.

as irrigation, rural roads, and market infrastructure.⁸ Key sector assistance during the CPS period will contribute to (i) increasing year-round irrigated area to 1.5 million hectares; (ii) increasing the all-season road network to 14,000 km; (iii) diversification of crops, with high value crop production increased to 6.5% per annum; (iv) commercialization of agriculture, and increasing agricultural exports by 16%; and (v) increasing resilience to the impacts of climate change and disaster risks by incorporating climate change and disaster screening and proofing tools in local planning.

14. In the irrigation subsector, ADB has focused on expanding irrigated areas using surface and groundwater, and building capacity of local governments. During the new CPS period, the \$11 million Water Resources Project Preparatory Facility Project (WRPPFP) will finance detailed design of irrigation projects to be financed through the proposed 2014 and 2015 pipelines.⁹ This will allow large civil works contract packages to be ready at loan signing and expedite project implementation. The WRPPFP has also given strong emphasis to gender, social, and environmental institutional capacity building in the implementing agencies—the Department of Irrigation and the Department of Water Induced Disaster Prevention. The WRPPFP is expected to complement the World Bank's focus on water resources data management, including updating of the real-time hydro-meteorological systems, technical assistance for disaster risk management, and investments in irrigation rehabilitation. The Building Climate Resilience of Watersheds in Mountain Eco-Regions Project (2013) will identify and construct suitable water storage interventions and develop upstream and downstream arrangements for payments for environmental services.¹⁰ The Bagmati River Basin Improvement Project Phase I and II (2013 and 2015) will support the establishment of water management systems at national and basin levels, which is the first pilot attempt in Nepal to apply IWRM.

15. In the rural infrastructure subsector, ADB has focused on the expansion of rural roads and community markets. Experience has shown that they have created much-needed employment opportunities for women and socially marginalized groups. To address the high fiduciary risks associated with small rural contract packages, ADB will focus on institutional strengthening of the concerned agencies to plan and implement rural road maintenance and investments through innovative modalities such as result-based and/or sector-wide lending.

16. In the agriculture subsector, the two ongoing projects¹¹ will contribute to reducing social and economic disparities by helping women and disadvantaged groups to upgrade their subsistence agriculture activities to agribusiness enterprises. The modality of grant-based business stimulus funding to the private sector was adopted to reduce the risk profile for change and new investments. The objective is to improve product diversification, increase value addition, and better integrate beneficiaries into their respective value chains. ADB will continue to support the reforms of the rural finance sector by strengthening the regulatory environment, promoting private sector participation, and strengthening sector capacity. ADB will also explore appropriate opportunities for private sector development and investment in agribusiness activities where high potential for private sector interest exists (processing and storage, among others).

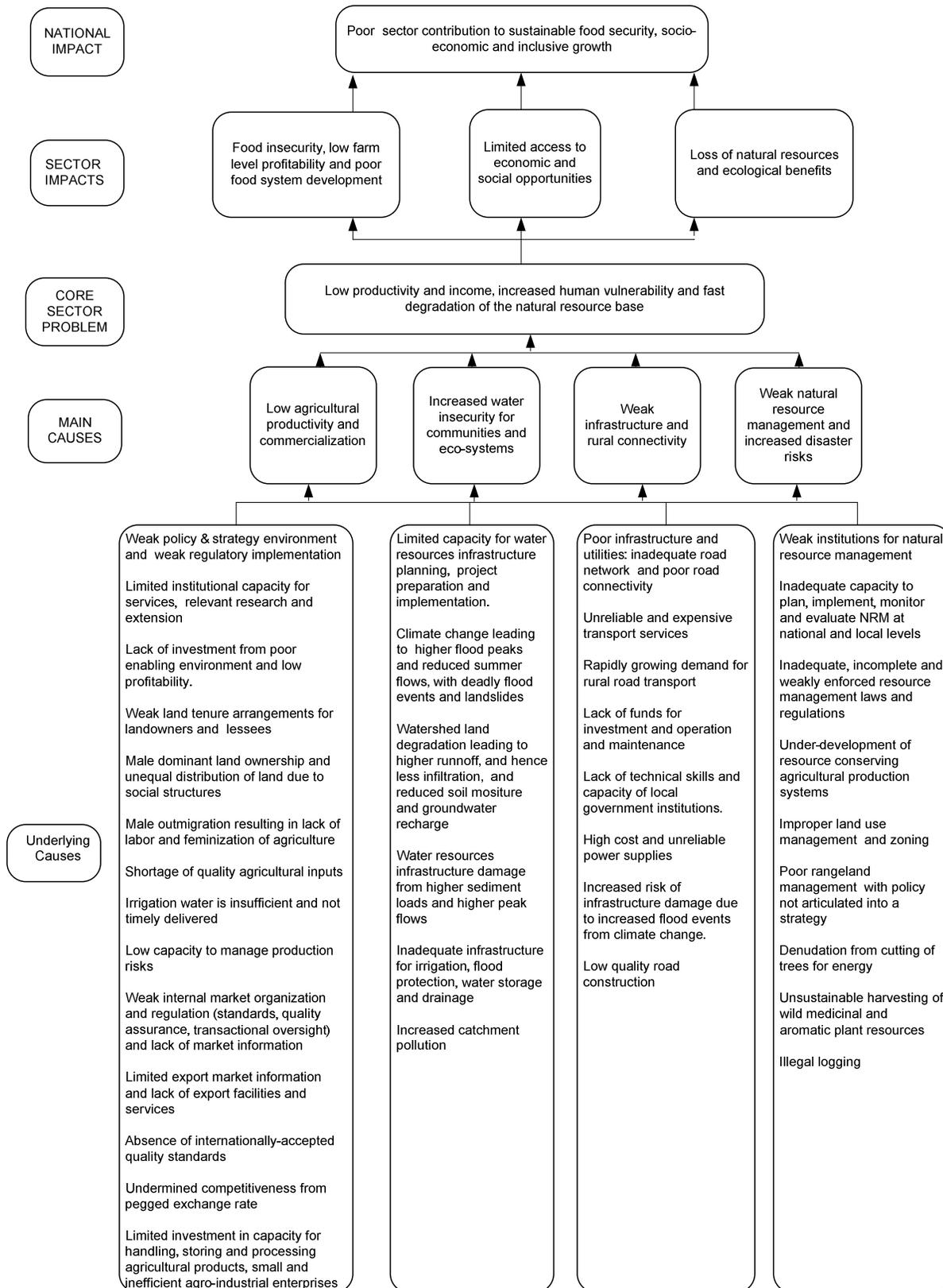
⁸ ADB. 2011. *Sector Assessment Performance Evaluation: Agriculture and Natural Resources Sector*. Manila.

⁹ ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Grant to Nepal for the Water Resources Project Preparatory Facility*. Manila.

¹⁰ Supported by the Pilot Program for Climate Resilience for climate vulnerable countries under the Climate Investment Fund.

¹¹ ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Grant to Nepal for High Mountain Agribusiness and Livelihood Improvement Project*. Manila; *Report and Recommendation of the President to the Board of Directors: Proposed Grant to Nepal for Raising Incomes of Small and Medium Farmers Project*. Manila.

ANR SECTOR PROBLEM TREE (draft)



Sector Results Framework (Agriculture and Natural Resources, 2013 – 2017)

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Sector Outcomes with ADB Contribution	Indicators with Targets and Baselines	Sector Outputs with ADB Contribution	Indicators with Incremental Targets	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Interventions
<p>Increased agricultural production, productivity, and food security</p> <p>Improved water security in the Bagmati River Basin</p>	<p>Agricultural GDP per capita <i>Target (2017): NRs12,660</i> <i>Baseline (2012): NRs 9,866</i></p> <p>Cropping intensity <i>Target (2017): 226%</i> <i>Baseline (2012):198%</i></p> <p>High-value crop production <i>Target (2017): 6.5% pa</i> <i>Baseline (2012): 5.6% pa</i></p> <p>Proportion of population generally food secure <i>Target (2017): 65%</i> <i>Baseline (2010): 58%</i></p> <p>Water availability in the upper Bagmati River Basin during dry season (at Gaighat) <i>Target (2025): 57 lps</i> <i>Baseline (2013): 38 lps</i></p>	<p>Agricultural infrastructure and systems expanded and improved</p> <p>Access to agricultural services increased</p>	<p>Area with year-round irrigation <i>Target (2017): 1.5 m ha</i> <i>Baseline (2012): 1.3 m ha</i></p> <p>All-season rural road network <i>Target (2017): 14,000 km</i> <i>Baseline (2012): 10,200 km</i></p> <p>Area used for commercial crops <i>Target (2017): 929,610 ha</i> <i>Baseline (2012): 822,664 ha</i></p> <p>Percent of rural households covered by agricultural services and programs <i>Target (2017): 17%</i> <i>Baseline (2012): 12%</i></p>	<p>Planned key activity areas Irrigation, drainage and flood protection (irrigation system management, flood protection) (31% of funding); Water-based natural resource management (water system development and conservation) (29% of funding); Agriculture and rural sector development (rural infrastructure) (40% of funding)</p> <p>Pipeline projects with estimated amount Bagmati River Improvement (\$30 m); Building Climate Resilience in Watersheds in Mountain Eco-regions (\$23.5 m); Community-Managed Irrigated Agriculture (Additional Financing) (\$30 m); Bagmati River Improvement II (\$29 m)</p> <p>Ongoing projects with approved amount Community Managed Irrigated Agriculture Sector (\$20 m); Community Irrigation (\$26.4 m); Raising Income of Small and Medium Farmers (\$20.1 m); High Mountain Agribusiness and Livelihood Improvement (\$20 m); Decentralized Rural Infrastructure and Livelihood - Additional Financing (\$25 m); Water Resources Project Preparatory Facility (\$11 m)</p>	<p>(i) Planned key activity areas and pipeline projects 35,000 households have access to improved domestic and irrigation water sources Availability of irrigation water during dry season of at least 0.3 liters per second/ha 15-year integrated river basin development master plan for Bagmati prepared 85,000 m³ storage capacity dam built</p> <p>(ii) Ongoing projects 111 irrigation schemes constructed/rehabilitated; 840 km rural roads and 366 rural water supply schemes constructed/rehabilitated; 290 trail bridges constructed; about 13,000 ha land irrigated; \$20 million worth high value crops produced/year; 7,500 jobs created ; About 7,500 ha under high value crops (64,500 mt worth \$44.5 million with gross margin of \$9.5 million); 200 km new and 60 km upgraded rural roads constructed. Representation of women in executive levels of farmer groups, cooperatives and water user associations increased to 33%</p>

ha = hectare, km = kilometer, mt = metric ton, m = million, NRs = Nepalese rupees, lps = liters per second, pa = per annum.

^a Targets have been set according to the government's targets under the Three-Year Plan Approach Paper (FY2014–FY2016).

Sources: Asian Development Bank and government estimates.