SECTOR ASSESSMENT (SUMMARY): AGRICULTURE, NATURAL RESOURCES AND
RURAL DEVELOPMENT

Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. Agriculture. Nepal has a cultivated area of 2.6 million hectares (ha), which constitutes 18% of the country’s total land area. Two-thirds of the country’s population continue to depend on agriculture, but land fragmentation is high, resulting in an average farm holding of only 0.68 ha. Nepal’s farmers predominantly have small holdings: farming households can be roughly classified into three groups: (i) small commercial farmers (with 1 to 5 ha or more of land) account for 20% of the rural population; (ii) subsistence farmers (with 0.5 to 1 ha of land) make up 27%; and (iii) the landless and near landless (less than 0.50 ha of land) account for about 53%. The agriculture sector contributed 28% of gross domestic product in fiscal year 2017. Most of this, however, was from subsistence farming—only an estimated 4% of farming households sell their produce in the market. Supply side constraints such as availability of quality seed and fertilizer, weak extension services, and difficulty in transforming research and development into actual farming practices have resulted in low productivity. Moreover, inefficient land-use policies, poor road connectivity and limited access to finance restrict commercial farming. These factors have led to Nepal becoming a net food importer since 1990. The agricultural trade deficit was estimated to be $1.1 billion in 2015. Moreover, key agricultural exports such as ginger, tea, and cardamom fluctuate widely. Poor understanding of international markets and prices and non-tariff barriers (sanitary and phytosanitary compliance) remain key constraints for agricultural exports.

2. Demographic change is impacting the agriculture sector in Nepal in many ways. First, population growth and urbanization have increased the demand for food, while diets have diversified as people’s purchasing power increases. This has pressured agricultural land in peri-urban areas, and food distribution systems are increasingly shifting and making use of modern outlets such as urban wholesale and supermarkets. Food safety is becoming more important as demand for animal products and processed foods increases, and people become more health conscious. The Government of Nepal estimates that, to meet the minimum dietary requirements for animal protein, per capita consumption of milk needs to increase by 30%, of meat by 17%, and eggs by 7% from current levels. Domestic production has been unable to meet the demand for more food, resulting in increasing food imports. Migration is also an important factor. Over 47% of households reported at least one migrant member, and Nepal received about $6.6 billion in remittances in 2017. Migration has resulted in (i) a shortage of rural labor (especially of men), leading to increased agricultural labor costs and a feminization of agriculture labor; and (ii) increased (a) fallow land in rural areas, (b) food consumption and diversification of diet, and (c) availability of finance for agribusiness development. Migrant workers are bringing home innovations and ideas, which can be seen in the form of new agribusinesses.

3. Water resources. Nepal’s elevation ranges from 70 meters (m) in the south to more than 8,800 m in the north. Nepal has four seasons along with a monsoon season that occurs during the summer (June–August) and early autumn (September–November). About 80% of the annual precipitation falls during the monsoon; annual rainfall ranges from about 150 millimeters (mm) to over 5,000 mm. Nepal is naturally rich in water resources with about 225 billion cubic meters (m³) (average flow of 7,125 m³/second) flowing annually through its 6,000 or more rivers.¹ Water availability is distributed across three categories of rivers based on their origins: (i) the majority of

¹ This corresponds to an annual per capita flow of 7,300 m³/second.
water (78%) is from rivers originating from glaciers and snow-fed lakes, and these form Nepal's four main river systems—the Gandaki, Karnali, Koshi, and Mahakali; (ii) about 9% of the water flows in rivers originating from the Mahabharat, including the Babai, Bagmati, Kamala, Kankai, Mechi, and West Rapti; and (iii) the remaining 13% flows in the streams and rivulets that originate from the Chure and Siwaliks hills. Only about 15 billion m$^3$ of the total is diverted—about 95.9% is used for agriculture, 3.8% for domestic purposes, and 0.3% for industry. In addition to surface water, around 8.8 billion m$^3$ is abstracted annually in the shallow and deep groundwater aquifers for irrigation and domestic water supply.

4. Nepal lacks the necessary infrastructure to store water, meaning much of the water is lost through high flows during the monsoon season. The average summer flows in the four main river are about 10 times higher than the winter (December–February) flows, leading to acute shortages and the need for efficient and equitable sharing in the dry season. Limited infrastructure to abstract water from rivers and aquifers results in an economic water shortage. Furthermore, the erratic monsoon climate and mountainous topography makes Nepal vulnerable to water-induced disasters, which result in loss of lives and livelihoods, and damaged infrastructure. The situation will be exacerbated by climate change, with an expected increase in rainfall intensity during the monsoon, and possible lengthening of the dry season. In addition, projected increases in temperature are likely to augment the frequency and intensity of glacial outburst floods.

5. Despite Nepal's large potential for hydropower, estimated at 43,000 megawatts, and featured as a cornerstone of the country's economic growth strategy, the developed capacity has remained far short of the planned capacity. Total installed capacity is currently estimated at 1,074 megawatts. New integrated water resources management (IWRM) legislation and a related institutional framework are indispensable to achieve greater hydropower development.

6. Of the 2.64 million ha of arable land in the country, 1.80 million ha is irrigable; of this, only about 0.55 million ha is provided with irrigation suitable for year-round cultivation, while 1.25 million ha is provided with basic irrigation. Irrigation efficiency is estimated at 35%, and water productivity is low. Irrigation water has been provided free of any significant charge, leading to overuse and making it difficult to realize effective cost recovery for operation, maintenance and modernization. Irrigation development should focus on modernizing irrigation systems, increasing the area under year-round irrigation, and institutional development, which is needed to improve system management, increase water saving, build knowledge, apply new technologies, and develop a better value chain for various agricultural products.

7. Environmental conditions in Nepal, and particularly in its rivers, are threatened by several factors. Widespread deforestation is resulting in decreased habitat and increased soil erosion. Increasing urbanization and an economy characterized by remittances has significantly increased unsustainable consumption and solid waste generation. A shortage of proper dump and landfill sites results in much of this solid waste being directly dumped into gullies and rivers. In the Kathmandu Valley the situation is alarming. The rivers in the valley, including the holy Bagmati River, are heavily polluted. Although most of the pollution is organic and rivers have some capacity for purification of organic wastes, plastic and heavy metals have been found in relatively high concentrations in the Bagmati River up to the Indian border.

8. IWRM and river basin-wide planning are required to effectively address the various critical aspects of water management. This is generally the case for all of Nepal, but is of particular importance in the Bagmati River, with its high competition for water resources and serious

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4 Current storage capacity in Nepal is estimated at 3.1 m$^3$ per capita considering only large dams.
pollution. Many projects have sought to instill basin management, but these have been frustrated by the absence of a legal framework. The new water policy and related water act, if adopted and promulgated, will provide such a framework. In Kathmandu, a de-facto basin management organization—the High Powered Committee for Integrated Development of the Bagmati Civilization—already exists, and recently was formally given river basin management tasks.

2. Government’s Sector Strategy

9. Agriculture. The Agriculture Development Strategy (ADS) provides the government’s 20-year strategic direction for the agriculture sector in Nepal, with a vision for a self-reliant, sustainable, competitive, and inclusive agriculture sector that drives economic growth, and contributes to improved livelihoods and food and nutrition security leading to food sovereignty. The core thrust of the ADS is in its focus on small commercial farmers and raising the productivity of subsistence farmers. The ADS framework has four targets outcomes which include (i) improved sector governance, (ii) higher agricultural productivity, (iii) profitable commercialization, and (iv) increased competitiveness. The ADS is ambitious and responsive to weaknesses in the agriculture sector, but its implementation has suffered from limited government financing and external assistance.

10. Water resources. The Water Resources Act of 1992 clearly identifies different water uses, provides priorities in water use, and establishes a basis for water users’ associations, a major step for participation in decision making. A more holistic approach was introduced with the Water Resources Strategy (2002), which identifies IWRM as the approach for water resources management and proposes an institutional framework for IWRM in river basins. The strategy was further developed into a strategic plan—the National Water Plan— which, based on a comprehensive analysis and consultation procedure, identified specific goals and related activities for 5-year, 15-year, and 25-year terms. Although the National Water Plan was never fully implemented, it has served as a guideline for water-related policies and planning.

11. Nepal’s new constitution (promulgated on 21 September 2015) changed Nepal from a unitary to a federal democratic republican state, with far-reaching consequences for society and governmental systems. Readjustment to the new federal state is ongoing, and requires comprehensive changes in legislation and institutional frameworks. Legal and institutional reforms initiated in the water sector prior to the new constitution—including under the Bagmati River Basin Improvement Project, supported by the Asian Development Bank (ADB)—had to be revisited.

12. The current constitutional reforms have reduced the number of ministries and combined the former Ministry of Energy and the Ministry of Irrigation. The newly combined ministry will facilitate IWRM implementation. It includes all water subsectors except domestic water supply and sanitation. The government is currently developing a federal water act based on a federal water resources policy that was submitted for approval to the Ministry of Energy Water Resources and Irrigation early 2019. The water resources policy adopts IWRM and basin planning as the main approach for water resources management. Under the new policy and act, river basin planning is proposed to be carried out at the federal level. The implementation of basin plans and provision of concurrence for various subsector licenses will be decentralized to three main river basin offices (Koshi River basin, Gandaki River basin, and Karnali River basin). The new legislation will form the foundation for rational, well-balanced water sector development, which

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4 ADB. Nepal. Bagmati River Basin Improvement Project.
can facilitate accelerated development of water supply and sanitation, hydropower, and irrigation. Successful implementation of the legislation will require substantial political support and capacity building.

13. The following complementary legislation supports IWRM: the Solid Waste Management Act of 2011, which prescribes fines for illegal dumping of waste in rivers; the 2017 Electricity Regulatory Commission Act establishing the Nepal Electricity Regulatory Commission for regulation of hydropower development; and the proposed Irrigation Act. The proposed Groundwater Act of 2017 would be better incorporated in the water resources act under preparation.

3. ADB Sector Experience and Assistance Program

14. ADB has been a key development partner in the agriculture, natural resources and rural development sector in Nepal, with projects in water management, value chains, irrigation, flood management, and rural infrastructure. Since 1994, ADB has supported five irrigation investment projects with components focusing on rehabilitation and expansion of medium- and small-scale irrigation schemes, and management transfer to and empowerment of water users’ associations. These were complemented by three projects focusing on agribusiness, and two projects aiming at enhancing rural connectivity. More recently, the $13.8 million Water Resources Project Preparatory Facility financed the preparation of (i) an Irrigation Master Plan, which is expected to be completed by fourth quarter of 2019, and that will guide future investment; (ii) a tentative $170 million Mechanized Irrigation Innovation Project that is planned to be presented to ADB Board of Directors for consideration in 2020; and (iii) a $50 million Priority River Basin Flood Management Project that is planned for ADB Board consideration in 2019.

15. Other development partners active in agriculture and natural resources are the European Union, Japan International Cooperation Agency, the United Kingdom’s Department for International Development, United Nations Food and Agriculture Organization, United States Agency for International Development, World Food Programme, and the World Bank. The World Bank and ADB have collaborated in the areas of irrigation and water resources.

16. In its country operation business plan, 2019–2021, ADB’s strategic direction is to increase agriculture and water productivity in a sustainable and integrated manner. Key emphasis will be given to interventions in (i) water management, including IWRM planning, institutional reforms, river restoration, and storage development; (ii) irrigation management improvement and groundwater development; (iii) flood management; and (iv) agriculture value chain development.

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7 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 (G0299-NEP).
Agriculture, Natural Resources, and Rural Development Sector Problem Tree

NATIONAL IMPACT

Poor sector contribution to sustainable food security, socio-economic and inclusive growth

SECTOR IMPACTS

Food insecurity, low farm level profitability and poor food system development

Limited access to economic and social opportunities

Loss of natural resources and ecological benefits

CORE SECTOR PROBLEM

Low productivity and income, increased human vulnerability and fast degradation of the natural resource base

MAIN CAUSES

Low agricultural productivity and commercialization

Increased water insecurity for communities and eco-systems

Weak infrastructure and rural connectivity

Weak natural resource management and increased disaster risks

Underlying Causes

Weak policy & strategy environment and weak regulatory implementation

Limited institutional capacity for services, relevant research and extension

Lack of investment from poor enabling environment and low profitability.

Weak land tenure arrangements for landowners and lessees

Male dominant land ownership and unequal distribution of land due to social structures

Male outmigration resulting in lack of labor and feminization of agriculture

Shortage of quality agricultural inputs

Irrigation water is insufficient and not timely delivered

Low capacity to manage production risks

Weak internal market organization and regulation (standards, quality assurance, transactional oversight) and lack of market information

Limited export market information and lack of export facilities and services

Absence of internationally-accepted quality standards

Undemanded competitiveness from pegged exchange rate

Limited investment in capacity for handling, storing and processing agricultural products, small and inefficient agro-industrial enterprises

Limited capacity for water resources infrastructure planning, project preparation and implementation.

Climate change leading to higher flood peaks and reduced summer flows, with deadly flood events and landslides

Watershed land degradation leading to higher runoff, and hence less infiltration, and reduced soil moisture and groundwater recharge

Water resources infrastructure damage from higher sediment loads and higher peak flows

Inadequate infrastructure for irrigation, flood protection, water storage and drainage

Increased catchment pollution

Poor infrastructure and utilities: inadequate road network and poor road connectivity

Unreliable and expensive transport services

Rapidly growing demand for rural road transport

Lack of funds for investment and operation and maintenance

Lack of technical skills and capacity of local government institutions.

High cost and unreliable power supplies

Increased risk of infrastructure damage due to increased flood events from climate change.

Low quality road construction

Weak institutions for natural resource management

Inadequate capacity to plan, implement, monitor and evaluate NRM at national and local levels

Inadequate, incomplete and weakly enforced resource management laws and regulations

Under-development of resource conserving agricultural production systems

Improper land use management and zoning

Poor rangeland management with policy not articulated into a strategy

Denudation from cutting of trees for energy

Unsustainable harvesting of wild medicinal and aromatic plant resources

Illegal logging