

SECTOR ASSESSMENT (SUMMARY): WATER RESOURCES MANAGEMENT IN NAM NGUM RIVER BASIN¹

A. Sector Performance, Problems, and Opportunities

1. The Lao People's Democratic Republic (Lao PDR) is a landlocked country covering about 236,800 square kilometers. About 90% of the country lies within the Mekong River basin. The country has rich and varied natural resources, including water. Total average annual available surface water resources in the Lao PDR are 272 cubic kilometers. Compared with other Asian countries, the Lao PDR has the highest per capita water availability. However, little of the national available water resources are developed. The total storage capacity of large reservoirs is about 3% of annual surface water availability, and hydropower generation is about 8% of its estimated national potential.² This sector assessment focuses on water resources and watershed management for sustainable water use in the Nam Ngum River Basin (NNRB).

2. Optimal and sustainable use of water is critical to realize the government's strategic objectives of poverty reduction and sustainable economic growth. Water is the most vital natural resources in the Lao PDR as its sustainable management is indispensable for agriculture, energy, and mining sectors. These sectors are critical for the country's economic growth, especially agriculture, natural resources, and environment sectors, which account for more than 40% of gross domestic product (GDP) and more than 70% of employment.³ Rice is the country's staple crop, accounting for about 25% of GDP as well as 67% of caloric intake of rural population. About 10% of GDP comes from livestock husbandry and fisheries and 8% from forestry. Providing adequate water and enhancing the productivity of irrigation systems is important to enhancing livelihoods and reducing poverty. Sustainable farming and forestry practices are indispensable to economic growth and poverty reduction. In addition, improved water supply and sanitation contributes to poverty reduction. Investments in improved watershed management practices need to be enhanced for sustainable natural resources use so as to maintain river flows and water quality, and to reduce sedimentation loads and peak discharges.

3. To exploit the considerable potential of water resources without compromising the long-term quality of the environment and the well-being of local communities, the government has promoted the adoption of integrated water resources management (IWRM) since 1998. The government established the Water Resources and Environment Administration (WREA)⁴ under the Prime Minister's Office in 2007. Water sector planning, development, and management are evolving, and coordination among key agencies at the central, provincial and district levels is a challenge, which contributes to limited accessibility of water resources data and information and poor planning.

¹ This is a subsector of the agriculture and natural resources sector in the Lao People's Democratic Republic (Lao PDR). This summary is based on (i) Southeast Asia Department, ADB. 2011. *Agriculture, Natural Resources, and Environment Sector Assessment, Strategy and Roadmap: Lao PDR*. Manila; and (ii) Department of Water Resources, Water Resources and Environment Administration (WREA). 2008. *National Water Resources Profile*. Vientiane.

² Department of Water Resources, Water Resources and Environment Administration (WREA). 2008. *National Water Resources Profile*. Vientiane.

³ Southeast Asia Department, ADB. 2011. *Agriculture, Natural Resources, and Environment Sector Assessment, Strategy and Roadmap: Lao PDR*. Manila.

⁴ The WREA was subsumed under the Ministry of Natural Resources and Environment (MoNRE) in June 2011. Since MoNRE is still in transformation, "WREA" remains in this document to show the functions which were earlier designated to the WREA.

4. Provincial departments of WREA are organized in parallel with, and linked to, the WREA departments at the central level. Some river basin committees have been formed for Nam Kading, Nam Ngum, and Nam Theun river basins to improve provincial level river basin management. The committees will oversee the development and implementation of river basin plans, coordinate water-related activities among the provinces, and advise on water policies and plans in the basins. However, provincial water resource management capacity is still limited with insufficient IWRM expertise and information. Civil society participation is an important part of the national public administration reform process, which includes decentralized water resources management, with a need for greater public awareness, participation, and consultation. The government intends to initiate sub-basin planning and monitoring for effective IWRM in the NNRB as a model for other river basins within Lao PDR.

5. Inappropriate agriculture and forestry practices have led to widespread land degradation. About 90% of the rural population relies on subsistence farming and many people also depend on food gathering from forests and rivers. Slash-and-burn agriculture is the predominant farming system covering almost 70% of the land in upland areas. Government policy aims to reduce unsustainable shifting cultivation, uncontrolled forest fires, logging, and land conversion for agriculture, plantations, and other purposes which have reduced forest areas and degraded watersheds. These activities typically lead to lower water discharges in the dry season and greater sediment loads and floods in the rainy season.

6. The NNRB is one of the most vital river basins in the country, and most of the large water sector investments have been made in this river basin. With a catchment area 16,906 square kilometers, and a population of 502,000 (2007), it is the fourth largest and second populous among the 12 major river basins within Lao PDR.⁵ The NNRB also includes mountainous areas where many ethnic people live. Through providing sustainable livelihoods for upland communities, improved watershed management in the NNRB effectively contributes to poverty reduction and inclusive economic growth in the country. The NNRB development plan⁶ has been prepared and needs to be implemented. The plan serves as the sector development plan together with the NNRB profile⁷ and national water resources profile.⁷ The Nam Ngum River Basin Committee (NNRBC) and its secretariat have been established and need to be strengthened, and the NNRBC is expected to be a model for river basin management in other priority river basins.

7. The Asian Development Bank (ADB), together with other development partners, has been assisting the government in developing institutional and human resources capacity and physical infrastructure in the water resources sector since 1989. In recent years, initiated under the Nam Ngum River Basin Development Sector Project, the WREA has been strengthened, and hydro-meteorological data management centered on the Department of Meteorology and Hydrology of the WREA is improving. The Department of Energy of the Ministry of Energy and Mines has been equipped with water management tools for planning and managing the Nam Ngum reservoirs. The Ministry of Agriculture and Forestry (MAF) has developed networks and replicable models for sustaining both natural resources productivity and rural household livelihoods in the upper watersheds. Countrywide capacity development in these areas, together with development of physical infrastructure and a knowledge base, requires further support to strengthen and capitalize on these initiatives.

⁵ WREA. 2008. *National Water Resources Profile*. Vientiane (prepared under the Nam Ngum River Basin Development Sector Project).

⁶ WREA. 2009. *Nam Ngum River Basin Integrated Water Resources Management Plan*. Vientiane.

⁷ WREA. 2008. *Nam Ngum River Basin Profile*. Vientiane.

B. Government's Sector Strategy

8. National goals for water resources management include providing clean water to all communities and eliminating shifting cultivation. Water resources management also relates to the national goals of food security, rural development, health, promoting hydropower production and other industries which depend on water availability, and environmental protection and conservation of natural resources.

9. The Law on Water and Water Resources (LWWR) was passed in 1996 and a prime minister's decree on implementation of the LWWR was enacted in 2001. The law and the implementing decree have introduced (i) integrated water resources management, (ii) ownership of water resources, (iii) national and river basin planning, (iv) monitoring and assessment of water resources, (v) water resource allocation according to integrated river basin plans, (vi) a specialized funding mechanism, (vii) public consultation requirements, and (viii) watershed protection. However, the national documents have not given a sufficient basis for coordinated planning and management of water resources between water-using sectors, and implementation of the LWWR remains limited.

10. One of the weaknesses of the LWWR is the delegation of water resource regulatory functions to water development ministries, and this may conflict with the water development and service delivery roles of these ministries and their agencies. The LWWR also appears to have gaps in: (i) information management; (ii) the coordination of water resource and environmental management; (iii) international coordination and management of water resource development; (iv) conflict resolution; (v) the role of, and administrative requirements for, water resource management by provinces and other local authorities, and mechanisms for water resource management and coordination at the river basin level; (vi) involvement of provincial and lower levels; (vii) the management of natural disasters and public safety (such as dam safety); and (viii) the basis for sustainable funding for IWRM activities.

11. The WREA includes the Department of Environment and Environment Research Institute (formerly under the Science, Technology, and Environment Agency), the Department of Meteorology and Hydrology (formerly under the MAF), and the Water Resources Coordination Committee and the Lao National Mekong Committee secretariats. The Lao National Mekong Committee Secretariat will continue as a coordinating body for activities under the Mekong River Commission system and Chiang Rai Agreement (1995), which is the basis of international coordination of water resource management. The Mekong River Commission and its national committees offer a valuable source of water resource management information and skills. The Department of Irrigation in the MAF is responsible for monitoring ambient water quality, the WREA deals with urban wastewater quality, Nam Papa Vientiane is responsible for urban water supply quality, and the Ministry of Public Health is responsible for drinking water quality.

12. Some topics, such as water quality and watershed management, are receiving increased government attention to guide the roles of the WREA and its various departments and the roles of other ministries and agencies. Strengthening strategic planning will ensure adequate staff and financial resources and expand environmental and water resource management functions, and a system of integrated watershed management planning is being gradually developed under the MAF, focusing mainly on land use and rural development planning. This process needs further development and coordination with river basin water resources planning. Development within the NNRB provides an opportunity to initiate new institutions for effective water resources and watershed management. Initial steps are being taken under the Nam Ngum River Basin Development Sector Project for institutional development for IWRM at the central and provincial levels and agricultural support services. Further assistance is required for the central, provincial

and district governments to improve and/or prepare their watershed and water resources management plans for harmonized overall water resources development and management.

C. ADB Sector Experience and Assistance Program

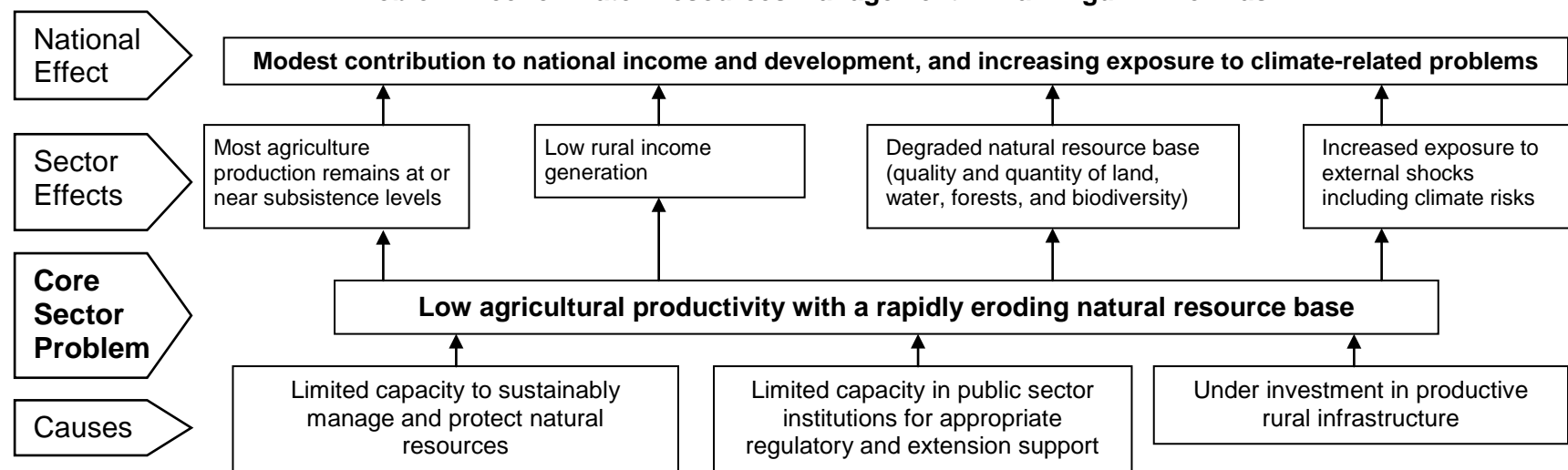
13. ADB's support in the agriculture, natural resources, and environment sector includes policy analysis and institutional reforms, investment in physical infrastructure, and productivity improvement. ADB has also been successful in building institutional capacity, especially in the water sector. As discussed in the sector assistance program evaluation⁸ in 2005 and the sector assessment⁹ in 2010, lessons in natural resources management show that securing the natural resource base is a necessary but insufficient condition for development of the agriculture and natural resources sector. Complementary investments must be made to raise productivity on a sustainable and equitable basis.

14. ADB support in the water sector has contributed to (i) planning and implementing national IWRM, (ii) preparing a capacity development framework for the WREA, and (iii) establishing the new NNRBC and its secretariat. Continuation and consolidation of these initiatives will be required, including further support for policy and strategy; capacity development of the WREA and river basin organizations; links between water, land use, environment, and development; and decentralized irrigation development. Technical assistance through National Integrated Water Resources Management Support Project will continue to support the government in building national capacity in integrated water resources management, updating the inventory of water resources and their utilization, preparing national groundwater management action plan, and strengthening IWRM education. The proposed Flood and Drought Risk Management and Mitigation Project will prepare for, respond to, and recover from the negative impact of floods and droughts through strengthening coordination for flood and drought management, upgrading water management infrastructure, and strengthening communities' preparedness for flood and drought events. The additional financing of the Nam Ngum River Basin Development Sector Project will operationalize participatory sub-basin management and sustain decentralized agricultural support services for improved integrated watershed management.

⁸ ADB. 2005. *Sector Assistance Program Evaluation (SAPE) for the Agriculture and Natural Resources Sector in the Lao People's Democratic Republic*. Manila.

⁹ ADB. 2010. *Evaluation Study: Agriculture and Rural Development Sector in the Lao People's Democratic Republic*. Manila.

Problem Tree for Water Resources Management in Nam Ngum River Basin



Sector Results Framework (Water Resources Management in Nam Ngum River Basin, 2012–2016)

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
Poverty reduction through increased rural incomes	By 2016 Average gender and ethnic disaggregated rural incomes have increased by 3% from 2010 levels	Integrated watershed management improved	By 2016 Capacity strengthened in MoNRE national and provincial offices Farmers and government staff trained for sustainable agricultural support services and natural resources management	Ongoing operation <ul style="list-style-type: none"> Nam Ngum River Basin Development Sector National Integrated Water Resources Management Support Pipeline projects <ul style="list-style-type: none"> Nam Ngum River Basin Development Sector Additional Financing (2011) Flood and Drought Risk Management and Mitigation (2011) Nam Ngum River Basin Management for Sustainable Livelihood (2014) 	By 2015 District development plans in 5 priority sub-basins updated to incorporate sub-basin management concept By 2016 Average income of project beneficiary households increased by 60% from 2012 levels.

ADB = Asian Development Bank, ha = hectare, MoNRE = Ministry of Natural Resources and Environment.

Sources: Southeast Asia Department, ADB. 2011. *Agriculture, Natural Resources, and Environment Sector Assessment, Strategy and Roadmap: Lao PDR*. Manila; The Design and Monitoring Framework for the Additional Financing.