

Water Resources Management in Lao PDR

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1. National water sector context

Around 80% of the country's area lies within the Mekong River Basin. The remaining 20% drains through Viet Nam directly to the South China Sea. The major tributaries of the Mekong all have significant watersheds. Besides the major tributaries of the Mekong, there are hundreds of small streams which mostly have a torrential regime during the rainy season and have a very low or no flow during the dry season.

The total annual flow of water flow in Lao PDR is estimated at 270,000 million cubic meters, equivalent to 35% of the average annual flow of the whole Mekong Basin. The monthly distribution of the flow of the rivers in Lao PDR closely follows the pattern of rainfall: about 80% during the rainy season (May-October) and 20% in the dry season, from November to April. For some rivers in the central and southern parts of the country (particularly Se Bang Fai, Se Bang Hieng and Se Done) the flow in the dry season is less: around 10 to 15% of the annual flow. The rivers outside the Mekong Basin flow through Viet Nam into the South China Sea. These rivers are Nam Ma, Nam Sam, and Nam Neune. The limited information on these rivers restricts assessment of their potential. The estimated inland water resources are approximately 723,500 ha. Of which 200,000 ha are from Mekong river; 54,000 ha from other main rivers; 57,000 ha from reservoirs, 1,500 ha from swamps; 406,000 ha from rice field; and 5,000 ha from fish ponds.

2. Water resources potentials and challenges.

The abundant water sources in Lao PDR have the potential to support socio-economic development, especially hydropower and irrigation sub-sectors. The hydropower potential of Lao PDR is great compared to other countries in the lower Mekong River Basin providing an opportunity to earn foreign income. The hydropower sector also has the ability to develop rapidly: it has increased its production about 5 times from 247 million kilowatt hours in 1976 to 1187 million kilowatt hours in 1999 when it exported 473 million kilowatt hours. The government has given high priority to investment in the irrigation sub-sector since agriculture is the foundation of national economic development, necessary for food stabilization and about 85% of the population lives in rural areas. Since 1976 to 2000 the area of irrigated dry season rice increased about 40 times: 2700ha to 110,000ha. The irrigation sub-sector also significantly increased the average yield of rain-fed paddy rice from 1.43 t/ha in 1976 to 3.27 t/ha in 2000. However, the water source development is still at a low level: irrigated area is only 20% of the national paddy area and hydropower production is still at 2% of its potential of 30,000 Megawatts. Development in other sectors is still at a low level compared to hydropower and irrigation.

Although some advances have been achieved in the water sector, problems still remain. These include: unusual rainfall patterns in some years, high evaporation, flood and drought in some of the main agricultural areas of the country; the impact of shifting cultivation on water resources although this activity has been significantly reduced; and conflict of interests for management within the sector since most water sub-sectors are still responsible for multiple roles of regulator, manager and service provider.

3. Overall socio-economic development context of priority areas

Within the water sector, the irrigation and hydropower sub-sectors remain the most important in terms of investment. Dry season irrigation, especially small pumping irrigation schemes, has been given highest priority in the short-term because of several consecutive years in which rice production was seriously affected by droughts and floods. Pumping schemes have successfully increased income in rural areas while delegating management to local authorities. The on-going program of transferring irrigation management to the beneficiaries has become critical to the sustainability of these schemes. This transfer of responsibility will need to be intensified in view of the number of pumping schemes being implemented.

In the short term, hydropower development will focus on medium, small and micro schemes for remote urban centres and rural areas. In the water supply and sanitation sub-sector, the target is to provide basic facilities to all provincial capitals and access to clean water for 70% of the rural areas by the end of the century.

In 1997, the real GDP growth was estimated at about 7%, slightly higher than in 1996. This result was mainly contributed by the agriculture sector: a result of favourable weather conditions after severe and extensive flooding in 1995-96.

In the Water Sector, irrigation contributes to self-sufficiency in food, to agricultural production and reduces shifting cultivation. Hydropower contributes through export power projects and also by reducing migration to urban centres through increased availability of electricity, rural development and income redistribution. Navigation improves transport links, particularly with Thailand, Myanmar and China. Fisheries are a major source of food and contribute to foreign earnings. Urban water supply meets industry and urban population's needs. Rural water supply and sanitation improvements increase the health and living standards of rural communities and assist tourism. Drainage, solid waste and sewerage provide for industry and development in urban areas. Water also maintains the natural environment and hence the welfare of Lao people by providing fish and animal protein and aquatic plants. Wetlands are a refuge for fish, animals and birds.

Article 19 of the Constitution of the Lao PDR is specifically devoted to the protection of environment. Action to protect the environment is considered a duty of all organizations and citizens. Recognizing the strategic value of the natural resources in the socio-economic development of the country, especially forests, land and water resources, the

national environment policy has a primary focus on the preservation of these resources while maximizing revenue generation and maintaining the livelihood of rural population.

4. Opportunities and threats for water resources development from the perspectives of WRCCS

The Lao PDR has plenty of surface water available but its quality is not always good. Land use changes appear to be altering the pattern of stream flows (known as the stream flow regime) and some supply shortages are occurring. Nevertheless, in general there is presently little conflict over water use. Increased water storage will be needed to support development. This additional storage will need careful management to prevent unwanted effects.

Throughout Lao, sediment is the primary river pollutant, although, close to the major developed areas, nutrients are also an issue. Some nutrients and some sediment are needed to support the aquatic environment; however, too great a quantity of nutrient may lead to algal blooms and encourage unwanted weed growth. Land that has little or no vegetation is the main source of sediment. The issue of sediment sources is being addressed in upland areas through the watershed management activities.

Present water quality is mostly good although the trend is to increasing pollutant loads. Because of this plans for increasing agricultural production through the application of high phosphate fertilizers should be implemented with caution.

Increasing population and higher population densities will increase health risks unless accompanied by good water management. Disease risks include dysentery, dengue fever, malaria, cholera and typhoid.

There is little information on the extent and capacity of groundwater systems. However, some use is already being made of the systems for water supply. This resource could be significant in some areas; particularly those underlain by limestone where large extraction rates could be expected from a single correctly placed bore. Such areas with high groundwater flow rates will also need careful management to avoid pollution from inappropriate land use.

Flooding is a major issue with damage occurring in both urban and rural areas. Floods caused community disruption, economic losses, and increase health risks. On the other hand, floods bring some benefits in building rich floodplains and replenishing soil moisture. Flood plain management could be considered to reduce flood damage by guiding sensitive development away from flood prone areas.

The population needs fish for protein. Fisheries also employ significant numbers of people and contribute economically. Fish populations are declining and this is becoming a serious concern. The reasons for this decline are not yet known. Changes in land use, declining water quality, construction of dams and other barriers to migration and high levels of capture are all likely to be involved. Reservoir fisheries are being developed to increase production.

5. LEGAL AND INSTITUTIONAL FRAMEWORK

5.1. Legal and Institutional context.

The Water and Water Resources Law of 1996, sets out a legal framework for development in the Water Sector. Many issues in the Law, particularly the roles and responsibilities of various agencies for specific activities such as water allocation and the process for licensing water users, need to be developed. There is an urgent need for the development of further legislation or decrees for sub-sectoral activities, as well as the necessary legal documents to accompany the Law and make it effective. Support to the Lao Government in this area should be undertaken in a counterpart relationship with the Department of Legislation within the Ministry of Justice as this agency has the final responsibility in issuing decrees. External assistance is also required in water sub-sector agencies to develop regulations. A pre-requisite for success in this field is the capacity building throughout the Water Sector because this is a new activity for the water sector which traditionally focuses on development rather than management and regulation.

5.2. Current situation and perspectives of the legal and institutional framework

The 1999 Mandate of the Water Resources Coordinating Committee (WRCC) defines the rights and duties of the WRCC. That list of rights and duties, although broad, is mainly directed to actions such as “study, monitor, coordinate and advise.” It also clearly indicates an important role for the WRCC in all of the IWRM functions mentioned below.

The 2001 Decree to Implement the Law on Water and Water Resources, issued by the Prime Minister, defines the structure of water resources planning and management at the national and river basin levels. The Decree states that the WRCC is:

“responsible for coordinating line agencies in drafting of strategies and action plans, programs and regulations necessary for the planning, management, use and protection of water and water resources. It is also responsible for monitoring, control, promotion and reporting on the implementation of activities related to water and water resources.”

The WRCC is composed of the Vice-President of STEA as Chairman and representatives of the following organizations nominated by the Prime Minister’s Office:

- Ministry of Agriculture and Forestry (MAF) (Vice Chairman);
- Ministry of Industry and Handicrafts (MIH) (Member)
- Ministry of Communications, Transport, Post & Construction (MCTPC) (Member)
- Ministry of Public Health (MPH) (Member);
- Lao National Mekong Committee (LNMC) (Member);
- STEA (Member)
- Lao Front for National Construction
- Lao Women Union
- Ministry of Justice

Development of sound legal, legislation, regulations and guidelines is one of the primary means by which the WRCC can play its coordinating role within the water resources sector. The process used must be open and consultative, involving stakeholders at the central, provincial and local levels. The WRCC already has some experience in this respect but further capacity building for policy analysis and development is needed. The WRCCS should establish an inter-ministry working group for legal and institution development. It should seek the comments of stakeholders through the awareness and consultation process described below. Legal and institution need to be accompanied with detailed implementation plans which indicate agency responsibilities and, where necessary, further capacity building to allow implementation to be successfully carried out.

5.3. Strengths and weaknesses of the current legal and institutional framework

Present organizational arrangements at both national and provincial levels; generally support the achievement of national policies. However, some agencies have conflicting roles such as *regulator and service provider*. This could result in *ineffective* implementation of government policies and enforcement of rules and regulations.

The government has a policy to decentralize planning and development to the provinces, with broad control and guidelines set at central level. This is to ensure that the local conditions and needs are appropriately considered.

While devolving the responsibility from central to provincial government assists in gaining greater community input, the task of achieving broad environmental outcomes and maintaining technical performance is made harder. Control of natural resources and cross-sector coordination needs to be considered in planning this decentralization.

The current institutional problem in the water sector mainly relates to lack of co-ordination between agencies within the sector and with those of other sectors, and loose line of communication and co-ordination between the national agencies and their provincial counterparts. The Water Resources Co-ordination Committee being established as a national apex body is mainly aimed at improving the co-ordination of multi-sectoral activities involving various water uses and also defining and managing water allocations. This is an important initiative for co-ordination at the national level enabling the Government to overcome the current fragmented management of water resources. The tasks of the WRCC are greater than just coordinating the activities of the sub-sectors. The WRCC should be vested with the responsibility of allocating the water resources among the various water users and the environment. To undertake this significant task in addition to coordination the WRCC requires a strong, dedicated and experienced secretariat. Measures required for co-ordination at the provincial level should not be viewed as of lower importance as the greater part of the national budget, covering project planning and execution, is managed by provincial administrative authorities.

The first step would be to assess the present institutional set-up at the ministerial and provincial level, and to conduct a diagnostic study of each targeted river basin. The findings of these studies could be used as a basis for designing a river basin management body tailored the development mix in each basin.

The policy of decentralization is now being implemented. Decision-making power is being moved from central government to the provincial level. This includes formulating annual work programs, project planning, implementation, and operation and maintenance. Service provision is also being transferred to local agencies and communities, such as provincial water supply agencies, irrigation water user associations, and village water supply management committees. State-owned service providers are vested with greater operational and financial autonomy and are usually operating within the administrative boundary of the province.

As a result, development objectives and investment performance depend on local commitment and capacity. Institutional strengthening and capacity building need is increased as a result of the changes now underway. Effort in this area should, therefore, focus on provincial and local levels and incentives for government employees should be biased to favour the provinces.

In all aspects of capacity building, at the central, provincial and local levels, efforts should consider and promote the capabilities of women. The aim should be to correct the imbalance of women's involvement in planning, management and decision-making in water resources development and management. The specific skills of women in the essential human aspects of this work (e.g. coordination and conflict resolution) should be encouraged.

6. Pilot river basin management to prevent conflict

Integrated Water Resources Management (IWRM) is the process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystem.

Water quality is not yet a problem but with more intensive agriculture upstream, it needs to be monitored closely. The basin's upper watersheds are critical for sustainable development and human welfare. They contain important biodiversity and are home to a variety of ethnic minority groups who are among the poorest in the country. Many of these watersheds are already under pressure from agriculture that is based on shifting cultivation and exploitation of forest products. At current use levels, these activities are unsustainable. To ensure long-term sustainability of the basin watersheds and livelihood opportunities they offer, an integrated development approach ought to be fostered among the farming communities, line agencies and departments alike. By implementing a variety of integrated activities, the Project would provide an impetus to that end.

To prevent conflict on water use, IWRM will be a unifying theme in the project. The Nam Ngum River Basin (NNRB) has been selected as the first river basin to initiate these activities due to the existing and planned water sector investments as well as its proximity to the capital, Vientiane. This Project is the culmination of the Government's, ADB's and AFD's continuing efforts, over the last several years, to establish and strengthen water sector institutions for their closer and more effective coordination. The design of this Project will afford a first real opportunity to both central and provincial departments to implement the IWRM approach through hands-on activities that are closely interlinked.

Optimal use of water resources in the country is the long-term goal of the project. Two immediate objectives of the Project are to: (i) foster and institutionalize the IWRM approach in the mainstream management process of the Government both at the central as well as at the provincial and district levels, (ii) support investment interventions in relatively degraded parts of NNRB to ensure sustainable watershed management and to provide livelihood opportunities for the poor and communities of ethnic groups.

References:

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