

## Water resources management in Lao PDR

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*In general, the progress in the integration of water resources management into economic and social development plans in the Lao PDR was found to be good through the assessment of various integration elements, such as progress in water resources assessment, monitoring and planning, in water supply and sanitation and in mobilization of community participant. The experiences in the Lao PDR showed a wide variety in the modalities and methodologies for the integration. Among these, the most commonly accepted methodologies were the long-term development plans and medium-term development plans (ten years). The most common top priorities in water resources development are the use of water resources for economic growth, food security and poverty alleviation. Information received from the responses was rich with respect to the legal and institutional framework which can be considered as an indicator of important progress in these aspects. The Strategic Planning and Management results indicated that planning information was the most important aspect in the coordination at the line-ministries concerns, but for the provincial/basin level, the water resources information was the most essential.*

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### Introduction

The Government of Lao PDR has set objectives in the 5 Year (2000-2005) Plan to develop, modernize and industrialize and achieve a high quality of life for all. In the process of developing its strategic planning and management the Government has specified three goals. These are: -

- Achieve an average economic growth of 8-8.5% per year, which will translate into a per capita income exceeding US\$500 by the year 2005;
- Devote at least 20% of public expenditure to the social sectors, making education, health and social welfare new 'beacon sectors';
- Make poverty alleviation the major reference for socio-economic development by giving major attention to basic rural infrastructure and social services.

These goals clearly require support from the Water Sectors. This sector comprises a number of agencies with resource development and management functions related to water and water resources. The sector is structured largely around the various uses of water such as hydropower, irrigation, water supply, fisheries and wastewater. These water sub-sectors have developed their programs to provide the support required for the GOL objectives. These programs, however, did not consider the potential for interaction between the policies and plans of the sub-sectors. This was because no agency was given overall responsibility for managing the water resource or the coordination of water developments.

The Water Sector Strategic plan has been developed to show how Water Sector activities support the Government's

objective of long-term socio-economic growth and to indicate the importance of these activities. The Water Sector Strategic plan consists of a vision and mission for the Water Sectors, a set of objectives and descriptions of key result areas necessary to achieve the objectives with short-term goals and activities within those key result areas.

### 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 River all have significant watersheds. Besides the major tributaries of the Mekong River, 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

the 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.

At the beginning of 2001, 140 gauging stations were in operation in Lao PDR. Nearly all of these are in the Mekong River Basin. This is an average density of about 1350km<sup>2</sup> per station, the highest among the countries of the Lower Mekong River Basin. Records of flow for the Mekong commenced in 1904. However, the records for the Mekong tributaries are much shorter and vary considerably in length and most tributary stations are located on the lower reaches of the rivers where access is not too difficult.

**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 high 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. In addition, there are several problems faced by the water sector. 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.

Being a least-developed country with rich water resources, the most important challenges for the Water Resource Coordination Committee (WRCC) in carrying out its coordinating role include: (1) to strengthen the legal framework for an effective and harmonious integration of water resources management, development and protection activities into the socio-economic development process of the country, in particular to meet national priorities; (2) to enhance and consolidate the existing systems and foundation to operate, maintain and rehabilitate facilities safely, reliably and efficiently to protect the investment for public benefits; and

(3) to prioritize the capacity-building needs so as to enhance organizational capacity and effectiveness of the water resources coordination system.

**Legal and Institutional  
Legal and Institutional context.**

Since 1991, the Constitution has become the foundation document for the socio-economic management of the country. It gives the basis for the functioning of a multi-sector economy, and provides the conditions for the education, culture and health of the Lao people. In June 1998, a National Commission for Constitution Review was established, in order to assess the impact of the new Constitution and to propose possible amendments in order to adapt to changing domestic, regional and global environment in Lao PDR, and to bring it in line with the nation’s new economic mechanism. This Commission considered options for improvement and proposed amendments. The amended Constitution underwent a nation-wide consultation process with the people, to ensure that the amendments met the real needs of the Lao people in the current economic period. The revised Constitution was approved by the National Assembly in March 2003.

The Water and Water Resources Law of 1996, sets out a legal framework for development in the Water Sector.

**Box 1. Water Resources Law and existing legal framework**

WRCC will pursue its coordinating roles aiming at improving water and related resource management, development, and protection activities. The framework for such coordinating roles would include:

- Administering the implementation of the Lao Water Resources Law and development of laws and regulations to ensure balanced treatment of sectoral perspectives and optimum water resources development benefits and effective decision making process;
- Formulating policy and strategies to improve water resources planning system of the country, with emphasis on a river basin water resources planning system;
- Formulating policy and strategies to improving efficiency of water use; and
- Promoting integration of applied sciences and technology into water resources management.

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 draft regulations. This assistance should cover both drafting and operational and enforcement aspects of 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.

### **Current situation and perspectives of the legal and institutional framework**

The WRCC Secretariat (WRCCS) is the executing body for the WRCC, responsible for any task assigned by the Chairman of the WRCC; and responsible for administration and financial matters of the WRCC and for the management of its assets.

The WRCC is composed of the Vice-President of Science, Technology and Environment Agency (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 and Construction (MCTPC)-Member;
- Ministry of Public Health (MPH)-Member;
- Lao National Mekong Committee (LNMC)-Member;
- STEA-Member.

The WRCCS is composed of the Director of Secretariat and a number of technical specialists.

Due to the necessity for wider coordination and contributions from water users in all aspects, the additional representations from the Ministry of Justice, Lao Women's Union and Lao Front for National Construction to the WRCC were needed. By the Prime Minister's Office Notice, No. 1908/PMO, dated 29 October 1999, a representative from the Lao Women Union was assigned to join the Committee. The two other assignments are still on the consideration process. At the same time, there is a need to increase the number of secretariat staff to improve the quality and quantity of technical inputs.

Development of sound legislation, regulations and guidelines is one of the primary means by which the WRCC can play its coordinating role within the water resources sector and within this Project. 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. Legal and institutional developments need to be accompanied with

detailed implementation plans that indicate agency responsibilities and, where necessary, further capacity building to allow implementation to be successfully carried out.

### **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. In the case of irrigation, for example, the Head of the Provincial Irrigation Service (PIS) is responsible to the Head of the Provincial Agriculture and Forestry Service Office (PAFSO). The head of PAFSO is then responsible to the Provincial Governor. The intervention of the Department of Irrigation in the provinces relates mainly to reviewing the annual irrigation development plans and budgets proposed by the provinces, providing technical assistance to the PIS, and monitoring the implementation of the annual work programmes. There is no involvement of a regulator to consider whether these plans conflict with natural resources or to set operating conditions.

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 lines of communication and co-ordination between the national agencies and their provincial counterparts. The WRCC 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. This will only occur with sustained support from donors such as ADB and a commitment from the top levels in the government. 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 to 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 programmes, 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, but are still limited in matters relating to personnel management, salary and incentives policies. State-owned service providers 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.

### **Mission and Vision Statements of WRCC Secretariat (WRCCS)**

The mission statement suggested for the Water Sector is

*Protect, manage and develop the water and water resources to achieve improved quality of life in Lao PDR*

As with the mission statement above, the words used have specific meanings. Protect refers to the need to ensure the continued supply of high quality resources. Manage refers to the activities of managing the resources, including managing access to the resources, managing developments that use the resources and managing the institutions with responsibilities related to the resources. Develop refers to converting the resources to new uses and to a mature state for the purpose of improved quality of life.

The 1999 Mandate of the Water Resources Coordinating

Committee defines the rights and duties of the WRCC. This 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 Integrated Water Resource Management (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."

In this connection, the Vision Statement of WRCCS is:

*"to attain the modern status of a state coordination agency to provide advisory services to the Government in decision making, based on a more balanced treatment of sectoral water perspectives, and to mobilize the public in their participation in the development, management and protection of the water and water resources to achieve improved quality of life in the Lao PDR".*

### **Mechanisms of Nam Ngum River Basin Management**

The first component will strengthen the capacity of WRCC and its Secretariat (WRCC/S), so that it can play a more effective role as a coordination body at both the central level and, through the Nam Ngum River Basin Committee (NNRBC), at the provincial level. The second component will assist Hydropower Office (HPO) to undertake hydrological modeling of the NNRB and to devise a more effective management regime for the Nam Ngum-1 reservoir to optimize power generation, mitigate floods, and improve water use efficiency in the Nam Ngum River Basin (NNRB). The third component will (i) strengthen capacity of the Integrated Water Management Unit (IWMU) and other relevant provincial and district departments, (ii) increase crop productivity and irrigation efficiency, (iii) improve livestock and fisheries management, and (iv) preserve and restore forest resources. The activities of the watershed management component that have been selected through an integrated water resources planning process at village, district, and provincial levels – a consultative process facilitated by WRCC and the NNRBC – will further serve to embed the IWRM approach within all levels of Government.

The activities of those components are focused on five important IWRM functions, which will be carried out under Project assistance. In general these are (i) policy and legislation, (ii) data and information management, (iii)



**The component and output is comprised of three main components:**

Integrated Water Resources Management, primarily involving support for the WRCC and its Secretariat (WRCC/S),

Reservoir Management and River Basin Modeling, mainly through support for the Hydropower Office (Department of Electricity, Ministry of Industry and Handicrafts), and

Watershed Management, involving support to the Integrated Watershed Management Unit (IWMU)(Department of Planning, Ministry of Agriculture and Forestry) and the National Agricultural and Forestry Extension Service (NAFES)(MAF).

Source: Nam Ngum River Basin Development Sector Project (NNRBDSP)

water resources planning coordination, (iv) training, and (v) awareness and consultation. To a large extent, these functions constitute the IWRM “agenda” in Lao PDR at the present time. Achievement of clear objectives in each of these areas, with Project support and active participation of many central and provincial agencies, will be a very important part of the process of building sustainable capacity for IWRM in this country.

However, the WRCC is not yet a well established and capable body, able to carry out its coordinating role through a clear and up-to-date strategic action plan. Other water management agencies also need support to fully understand and internalize IWRM concepts and functions into their regular operations. Senior decision makers, water users and other stakeholders also need to be assisted to gain a fuller awareness of the vital nature of water resources and new approaches for their sustainable management.

### **Policy and legislation development**

Lao PDR has made good progress in recent years in developing water resources policy, legislation, regulations and guidelines. However, some of the policy remains at a general level, without sufficient detail and corresponding legal documents to allow full implementation. The Draft Policy on Water and Water Resources (2000) is in the final approval stage and may serve as a “framework policy” under which more detailed policy topics on priority water resource management issues can be developed. Both the 2001 Decree and the 1999 WRCC Mandate give the WRCC a role in developing policy and regulations and it appears from comments by other ministries and agencies that they see this as an important role for the Coordinating Committee.

### **Data and information management**

Data and information management is a critical aspect of IWRM. Water resources data access and coordination are identified in Lao PDR, as in many countries, as a major problem. Data may be expensive to obtain or its existence or location may not be known to those who need it. Resolv-

ing this issue will be critical during the Nam Ngum River Basin Development Sector Project (NNRBDSP) in order to achieve project objectives, particularly with respect to planning and modeling, and integration between project components. The 1999 WRCC Mandate includes the duty to “encourage, support and promote the exchange of data and information relevant to water and water resources.” This is clearly an area that requires full cooperation among a wide range of agencies.

### **Water resources planning**

The 1998 Strategic Action Plan (SAP) mentions that the Committee for Planning and Cooperation (CPC) is responsible for the five-year plan, cross-sector programs, the public investment program and long-term strategic planning. At the same time, the Government has a policy to decentralize planning and development to the provinces. Projects are developed at the grassroots level and aggregated at higher levels.

While devolving the responsibility from the central level to provinces and local authorities tends to foster greater community input, it does not allow cross-sectoral and upstream/ downstream impacts within river basins to be taken into account. There is therefore a strong need to introduce integrated river basin planning to develop, at a minimum, framework or guideline plans that will direct the sectoral and localized project planning to be done in a way which minimizes negative impacts and promotes the achievement of broad national objectives.

The WRCC/S will play a central role in coordinating the preparation of a basin-wide water resources plan for the Nam Ngum river basin. It will ensure that national objectives are recognized and that the planning process is balanced in terms of sectoral perspectives and carried out in a transparent and participatory manner. The HPO will also play a major role in hydrological and reservoir operational modelling for the basin. Provincial / municipal governments and the NNRBC will facilitate stakeholder involvement in the identification of issues for planning and consultation on water resource development and management alternatives.

At the sub-basin level the IWMU is expected to prepare watershed management plans within the context of the overall river basin plan. The linkage between river basin and watershed management planning will be developed during the project. It is likely to involve identification of important water resource issues in upper watershed areas, sharing information on land use patterns and water use within sub-catchments, and use of common data management and awareness creation procedures.

### **Training**

Most of the IWRM functions are new or relatively new in Lao PDR. Considerable training is needed for managers and technical staff in order to build the capacity for sustainable implementation of IWRM. Training is expected to include a range of activities such as (i) long and short-term

international study (fellowships and degree programs), (ii) international study tours for senior officials as well as managers and technical staff, (iii) dissertation support for visiting scholars to study specialized topics which are relevant to the implementation of IWRM in Lao PDR and the NNRB, (iv) workshops ranging from general awareness of IWRM concepts to more specialized and focused topics, and (v) other training topics, such as English and French language training, computer skills, management training and training-of-trainers.

### **Awareness and consultation**

While training can be seen as a specialized and formal transmission of knowledge and skills, awareness and consultation involve the delivery of information and general knowledge, often to broader target groups. These target groups can include senior officials, managers and staffs who are directly or indirectly involved in water resource management, water users, and students in the public education system and the general public.

Awareness activities should be carefully designed for each specific target group. Senior officials such as Ministers, members of WRCC or other senior managers may benefit from such things as study tours in which they can view and discuss policy and management aspects of IWRM with counterparts in countries with more advanced water management systems. Awareness activities at the staff level may include workshops, study tours, and distributed information on various aspects of IWRM in relation to their agencies mandate. Awareness for water user groups as well as for the school-based programs will need to be designed more specifically to give both a general appreciation of the water resources and the new approaches being taken to their management, as well as steps which users can take to support improved management and conservation.

### **Concluding remarks**

Progress has been made by IWMU regarding awareness creation and grassroots involvement in the watershed planning process. WRCC/S needs to use this experience in developing community-level awareness and involvement in the IWRM process in the NNRB and elsewhere. Activities under the NNRBDSP will also need to be coordinated with other ongoing water, natural resource and environmental awareness activities such as through the mass media and public education curricula.

Consultation activities should also be directed to providing openness and transparency in IWRM decision making as part of improved water sector governance. Activities of WRCC and GOL, to the extent possible, should be made public. Consultation on draft policy and legal decisions, water resource planning scenarios, and similar topics should be carried out with stakeholders.

### **References**

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