



## Water planning in LAO PDR

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**Type of tool:** water planning

**Issue:** watersheds, industry, agriculture, cities

**Location:** Lao PDR, Asia

### The challenge and aims: water and growth in LAO PDR

Although it still is one of the poorest countries in South East Asia, Lao People's Democratic Republic might actually be one of the most dynamic and rapidly transforming poor economies in the world. The economic reforms carried out since 1986 – when the transition from a centrally planned to a market economy started – represent in many ways the breaking free from the low income and poverty situation in which its rural and traditional society was trapped. The first decade of the new century was marked by rapid economic transformation with rates of economic growth that averaged 9% annually. In spite of rapid population growth that averaged 2.8% in the eighties and nineties, the economy was able to grow enough to improve the per capita gross national product in such a way that the real purchasing power parity per inhabitant in 2009 was more than four times that of 1970 while the population increased from 2.8 to 6.4 million in the same period<sup>1</sup>. These favourable trends and the current macroeconomic equilibrium make the prospect of becoming a middle income country before 2020 likely, as intended in the National Socio-Economic Development Plan.

Advances were not only significant in terms of the scale of the economic activity but also in some relevant aspects of human development. Life expectancy at birth improved from below 50 years in 1980 to more than 65 in 2010 and the average years of schooling more than doubled in the same time averaging 4.6 in 2010. When compared with other countries Lao PDR was ranked sixth in the list of countries showing greatest improvements in the 20 years since the Human Development Index making assessments.

Successful economic growth is behind the steady decline in poverty indices which, as measured by the Millennium Development Goals Assessment Criteria, passed from 46% to 33% between 1992 and 2002. While the number of those below the poverty line is diminishing and they are

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<sup>1</sup> These figures were obtained from using the Penn World Tables (Heston, A., Summers, R and Aten, B. (2011) Penn World Table Version 7.0. Center for International Comparisons of Production Income and Prices. University of Pennsylvania May.



becoming less poor on average, economic growth is also increasing economic inequality and the share of the poorest quintile in national consumption also fell from 9.6 to 8 percent. Net enrolment rates in primary also rose from 58% of primary school-age children in 1991 to 84% in 2005, although progress in retaining students is still low at this level. Significant advances have been made in gender equality (the number of girls for 100 students rose from 77 to 86 in primary school between 1991 and 2006 and these advances are lower but still significant in secondary and higher education). Advances in the MDGs are completed with relevant improvements in child mortality, maternal health, steps against malaria, HIV and other diseases and the country is considered to be on a relatively safe track to reach the MDGs by 2015<sup>2</sup>.

### **The challenges for water planning**

The significant increase in the number of people with access to safe water, rising from 30% to 60% of the total population between 1990 and 2003, is associated with relevant reductions in the time required to meet basic water needs for many households, freeing time that is now available for education, child care and income earning activities with important benefits also in terms of gender equality. Apart from its undeniable relevance for the many concerned households, in a context of economic growth, these benefits lead to an increase in the labour supply and therefore the productive potential of the entire economy.

In addition to that, the increased coverage of improved sanitation facilities (from 11% to 45% between 1990 and 2003) means an effective reduction in water related diseases. This is association with significant improvements in the effectiveness of education, the productivity of labour and in life expectancy at birth which all contribute to increased and improved human capital, a crucial production factor in any growing economy.

Subsistence agriculture still accounts for nearly half of the gross domestic product and provides 80% of the employment as 69% of the population still live in rural areas. Nevertheless, low lands suitable for agriculture are relatively scarce in Laos (no more than 13% of the watershed, compared with 72% in Cambodia and 65% in Thailand) and without modern techniques and appropriate soil preparation, Laos' arable land is mostly suitable for rice cultivation. As a consequence, cropping still follows the natural supply of rain, being at its peak during the monsoon season and declining to less than 10% in the dry season. Food security is still heavily dependent on water supply. Improvements in health, water supply and sanitation, as well as some irrigation development, are responsible for the substantial reduction in rice shortages in most of

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<sup>2</sup> See Government of Lao PRD and the United Nations (2010) Millennium development Goals: Progress report Lao PRD 2008.



the lowland cultivated areas of Laos. Rice pads also provide fish which is the other important protein source in rural Laos<sup>3</sup>.

Growth in population and income levels leads to an increased demand of agricultural products that, without the development of competitive products to be exchanged in the international markets, can only be satisfied by increasing local production of food. This is possible with both the above mentioned improvements in human capital as well as the existence of abundant water resources. The increase in rice yields per hectare, due to mechanisation and irrigation development, has led to higher amounts of stubble available for grazing and feeding more pigs, chickens and ducks. In terms of growth and development, this productive transformation allows food production to increase, even when part of the rural workforce are migrating to expanding urban areas. It also serves to diversify the rural economy beyond traditional subsistence, allowing for the production of market and income earning goods and integrating the rural economy into the local and international economy.

Development also comes with and is supported by an increase in energy consumption. Although Laos has only developed about 4% of its potential for hydropower, it is already recognising the value of expanding power generation capacity and distribution networks in order to foster economic development both in rural and urban areas. It is estimated that 26 hydropower projects are under construction in the lower Mekong basin and at least 12 mainstream projects and 30 tributary dams are planned for the next 20 years, mostly in Lao PDR. Although hydropower is the main purpose, the water storage capacity that comes with it is important for promoting development in other critical areas and particularly for providing reliable water supply for new irrigation developments (covering between 100 to 300 thousand hectares in Laos in the next 20 years), providing flood control, aquaculture, and an opportunity to develop tourism.

### **The drivers of planning**

Although access to water and sanitation services has been extended rapidly, further advances require reaching populations in upland regions and scattered rural areas. Providing these services in hard to reach areas where crop yields are often lower and more uncertain (due to poor soil and traditional practices) is still financially challenging, due to both provision costs and low capacity to pay in the receiving communities.

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<sup>3</sup> See also: Nessbitt, H. Johnston, R. and Solien, M. (2004) Mekong River water: Will river flows meet future agriculture needs in the Lower Mekong Basin? In: Seng, V.; Craswell, E.; Fukay, S. and Fischer, K. Water in Agriculture. ACIAR Proceedings 116e.



In the years to come, economic growth is expected to continue to be based on economic diversification, integration in the regional and international markets, and progressive advances in infrastructure and human capital development. Expanding populations with improved living standards will lead to the demand for agricultural products and electricity that will become the main driver of the transformation of the rural economy. In spite of its relative abundance, water development needs to consider the compatibility between the multiple uses of water. For example, hydropower might result in alterations of river flows and sediment balances with consequences for fishing, biodiversity, and the water supply for irrigation. The changes required to increase crop yields might also alter water quality with significant impacts on biodiversity. The expansion of agriculture and livestock in uplands might result in significant losses in forest and biodiversity with impacts on runoff and erosion.

All countries in the Mekong River basin are dynamic transition economies and compared with China in the upper basin, and Vietnam and Thailand in the lower basin, Laos is in the relatively early stages of water development. This means that development strategies need to be coordinated in order to avoid water conflicts and to guarantee the sustainability of social improvements. Laos provides at least 35% of the renewable water resources of the Mekong River basin and has well preserved water ecosystems whose services can be harnessed for economic development. But water development in Laos might have significant consequences for the water resources in Cambodia and Vietnam, particularly for their extended irrigation systems. Developments in Laos could potentially aggravate saline intrusion problems already present in the river delta, just as hydroelectric development in China has had impacts on the lower basin.

### **Main barriers to planning**

The main barrier is the lack of institutional development, the limited information available and in general the short history of water governance in the country. All this makes reaching the required consensus, involving relevant stakeholders, defining a set of measures, selecting projects, and implementing and monitoring them a difficult task.

### **The approach to water planning in Lao PDR and the green economy**

Water management has played a crucial role in starting and sustaining growth as well as in the advances made so far in human development. The development of water resources represents a mix of opportunities and challenges for the transformation of the Lao PDR's economy. Water policy plays an essential role in a progressive economic development strategy with already proven benefits in terms of poverty reduction, gender, and equity. Despite the multiple challenges faced, a development strategy based on an integrated water resource management



framework has the potential to make the transition of the economy compatible with conservation of the water resources. Water planning requires the development of an institutional framework and the social and technical capacity to implement development strategies agreed on through a participatory and transparent decision-making process. The building of these institutional abilities is already in progress.

Water development can make a real contribution to economic growth and socio-economic development in the whole river basin, but decisions need to be coordinated to avoid conflicts between competing water development priorities both at a national level, between water users, and at an international level. Coordination is also required to guarantee the welfare gains of economic development are preserved in the long term.

#### *The Agreement for Cooperation*

By subscribing to the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin in 1995, the governments of Cambodia, Laos, Thailand and Vietnam agreed to jointly manage the basin's water resources and to coordinate decisions concerning the use of these resources for economic development. The Mekong River Commission (MRC) was formed for this purpose and in 1996 China and Myanmar became dialogue partners of the agreement and they are now working together within a common cooperation framework.

#### *Developing a shared understanding of the opportunities and risks: creating a shared strategy and defining priorities and objectives*

For the first time since the Mekong agreement was signed in 1995, the member countries have developed a shared understanding of the opportunities and risks of the national plans for water resources development and agreed in 2010 on an integrated water resource management based basin development strategy for the Lower Mekong basin. This strategy is based, first on the identification of a set of “strategic priorities to optimise the development opportunities and minimise uncertainty and risks associated with them”; second on the agreement on the “urgent priority to develop and agree on basin-wide environmental and social objectives and baseline indicators, against which to apply future developments”; and third on the understanding of the “critical importance of strengthened basin management and in particular a strong programme of institutional, technical, organisational and human resource capacity building for sustainable basin development”<sup>4</sup>.

#### *Coordination of national water development*

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<sup>4</sup> See Mekong River Commission (2010) IWRM Based Basin Development Strategy for the Lower Mekong Basin.



Provided the institutional framework is already in place, international cooperation can be a powerful instrument to coordinate national water development, transforming potential conflicts into mutually beneficial agreements. Advances have also been made in translating river basin priorities to national basin development plans<sup>5</sup> and in particular, for the case of Laos, to integrate them into the economic development strategies<sup>6</sup>.

Water planning at the basin level enables an assessment of the costs and benefits of the different development options from a social perspective, rather than only on the basis of private and individual interest. Some examples in the Mekong River show how, for example, existing and planned hydropower development in the upper basin in China can be adapted to provide sufficient dry season flows to meet all consumptive demands in the lower basin as projected in the national development plans for the next 20 years while maintaining the baseline water flows.

#### *Establishing an IWRM approach*

Besides the VII NESDP, some other National Policies and Strategies should be taken into account, such as the National Water Resources Policy and the Strategy and Action Plan. The main objectives and challenges were agreed to be the following:

- Institutional strengthening and cooperation
- Legislative and detailed strategies
- River basin and sub-basin water resource planning
- Data collections and analysis
- Water allocation
- Protection of water quality and natural health
- Management of water resources risk
- Financial aspect of water resource management
- Awareness, participation and capacity building

<sup>5</sup> See Mekong River commission (2011) Planning for BDP 2011-2015 Bridging Period.

<sup>6</sup> See: Lao People's democratic Republic. Ministry of Planning and Investment (2011) The Seventh National Socio-Economic Development Plan (2011-2015).





### *Considering all potential benefits and costs of different development alternatives*

Water planning at the river basin level allows for the consideration of all the potential benefits of hydropower development, for example, fishery or tourism potential in the reservoirs and the reduction of flood damage and salinity intrusion downstream. However, costs and environmental impacts also need to be recognised, in particular when these impacts are unavoidable and irreversible. Hydropower development, for example, can result in changes in sediment flows causing irreversible river bed incision and bank erosion with some predictable impacts such as wetlands losses, impaired agricultural productivities, reduced potential of freshwater fisheries and potential impacts on marine fisheries depending on the river's nutrients loads. Understanding all costs and benefits and the associated risks of different development options is essential for agreeing on which options to adopt, the distribution of the costs and benefits, and the necessary measures to compensate or mitigate potential damages and minimise the risks<sup>7</sup>.

### *Creating institutional capacity and generating hydrological information*

Institutional capacity development is critical in all member countries for the effective implementation of surface and groundwater monitoring, water use permitting, compliance assurance of permit conditions and regulations, and maintaining a water information system. Most of the procedures to be implemented have been developed and adopted in the framework of the Mekong River Committee and others are under study.

### *Engaging and coordinating national public actors*

A number of government bodies are involved in water resources management in some way:

- The Lao National Mekong Committee (LNMC): responsible for coordination with the Mekong River Commission and for supervising the planning and the management of river basins in Lao PDR consistent with the Mekong Agreement and its plans and strategies. It works as the national water resources apex body.
- The Ministry of Agriculture and Forestry (MAF): deals with issues related to cultivation, irrigation, livestock, fisheries and forestry.
- Ministry of Communication, Transport, Post and Construction: responsible for urban water supplies and inland waterways.

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<sup>7</sup> See Mekong River Commission (2010) Assessment of Basin Wide Development Scenarios. Technical Note 13: Economic Benefits and Costs.



- The Ministry of Energy and Mines: responsible for electricity, hydropower and mining.
- The Ministry of Health: responsible for safe drinking water.
- The Prime Minister's Office.
- The Science Technology and Environment Agency (STEA)
- The Water Resources and Environment Administration (WREA), including a Department of Water Resources, Department of Meteorology and Hydrology and environment responsibilities. It has a mandate for management of water resources, the environment, meteorology and hydrological activities throughout the country.
- The National Tourism Authority

Lao PDR has the following levels of administration:

- The National Government
- 16 Provinces and Vientiane Municipality
- 142 districts
- About 11,400 villages

#### *Creation of River Basin Committees*

One of the most important aspects of this scheme is that a body of 17 Provincial Water and Environment Offices are represented. These Provincial organisations will work in close cooperation with the River Basin Committees (RBCs). As a matter of fact, WREA works mainly as the technical support organisation for the RBCs. The RBC is a non-permanent organisation. It has a mandate to act as a water resources executive in the river basin under the direction of the Lao National Mekong Committee for the management, development, conservation, rehabilitation and utilisation of water resources in the river basin area.

The RBC will be chaired by a Provincial Governor, elected on a five-year basis by the Riparian provinces, along with a supporting Secretariat. The Secretariat acts as a technical advisory body to assist the RBC in facilitating and monitoring all its activities. The RBC consists of government and individual representatives and other related sectors who are nominated by the





Prime Minister of Lao PDR based on the proposal of the Prime Minister's Office, the Head of the WREA. The chairperson takes initial action based on the agreement of provincial river basin representatives.

The very first RBC was the Nam Ngum River Basin Committee. The NNRBC was established by the Prime Minister's Decree 293 on June 15th, 2010 as the first of several such organisations in the country. The importance of this particular RBC is strategic because it was the first IWRM plan and will serve as template for River Basin Committees elsewhere in the Lao PDR.

The following main objectives and plans for the future of the NNRBC have the highest importance for the future of water management in the country:

Task 1: Building the capacity to manage the NNRBC

Task 2: Encouraging sustainable water use

Task 3: Optimising hydropower outcomes

Task 4: Developing the sustainable potential of the basin

Task 5: River sub-basin management

Task 6: Reducing risks and impacts from water related disasters

The main tasks for the NNRBC are clearly closely related to the goals of the VII NSEDP.

#### *Developing the legal framework*

The main legal documents are the following:

- Decree on the Establishment and Activities of Water Resources and Environment Administration, No. 149/PM, dated May, 10th, 2007.
- Decree on the Establishment and Activities of Lao National Mekong Committee, No. 197/PM.
- Decree on the Establishment and Activities of the River Basin Committees, N° 293/PM, dated 15 June 2010.



The last of the aforementioned Decrees, Decree 293, puts into place an intergovernmental and multi-sectoral body to sustainably manage the priority river basins and sub-basins of the country. The Decree is a significant milestone for implementing several water resource management programmes and projects in Lao PDR.

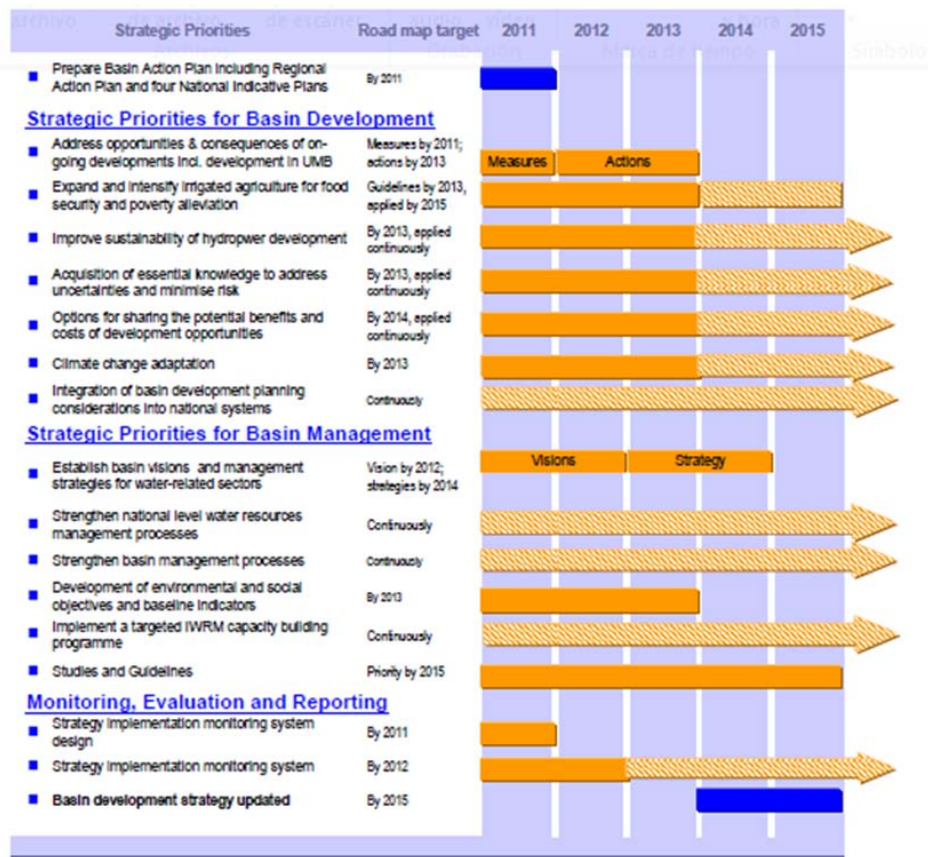
Decree 293 outlines the responsibilities, duties, jurisdictions, organisational structure and working methodology of the River Basin Committee to promote water resource management through systematic planning and implementation. The objective of the RBC is the achievement of the following goals:

- Supply sustainable water resources to water sectors through systematic planning and implementation
- Reduce socio-economic and environmental impact from water related disasters
- Manage water quality in the country
- Improve livelihoods
- Contribute to the national socio-economic development plan

*Agreeing on a roadmap and ensuring national ownership*

The whole strategy is outlined on a road map which guides its implementation until the end of 2015. The strategy is owned and implemented by each member country.

### **The Road Map of IWRM: 2011-2015**



## Evaluation

Considerable progress has been made so far in the development of an institutional framework for water planning. These advances are more evident at an international level and they provide the basis for developing water planning institutions at national and local levels.

The Nam Ngum River is a main tributary to the Mekong River in the Lao PDR. The area of its basin is 16,841 km<sup>2</sup> (7% of the country) with a population of some 550,000 people (8% of the country). With a rainfall of 2,200 mm per year and a discharge of 22,000 million m<sup>3</sup> per year, the basin contributes 14% of the flow of the Mekong River at the confluence, and 5% of the total discharge to the sea.

The benefits of a functional RBC to coordinate the many agencies and levels of government became clear during the preparation of the Nam Ngum River Basin Development Sector Project (2004-2010). This project developed the approach and capacity for river basin management



including the development of a comprehensive knowledge base, the preparation of a basin development plan, and the generation of human skills and capacity.

The NNRBC now operates under the umbrella of the Lao National Mekong Committee for national water resources management as well as in compliance with the Mekong Basin Agreement and in collaboration with the Mekong River Commission.

### Main lessons learnt

<b>The approach</b>	<b>Lessons learnt from implementation</b>
<i>Reaching a social agreement on the desired balance between water use and water resource conservation</i>	Adopting a set of international commitments regarding the environmental status of the Mekong River Basin in Laos has been a central element of the coordination of water planning with national development policies.
<i>Harnessing development opportunities and coping with water and development challenges</i>	Water policy has been the cornerstone in Laos' success regarding the Millennium Development Goals and in the ongoing transition from a rural to an urban economy.
<i>Building governance and institutional capabilities</i>	An ambitious programme of building water governance structures is already in place in Laos. Transparency, regulation and enforcement, and building technical competences are key elements for this strategy to succeed.
<i>Coordinating public policies</i>	The agreed commitments of the international Mekong agreement have been a central element in the National Development Plan of the Lao PDR and have contributed to the coherence between objectives in the different economic sectors and the general objectives of water policy.



<p><i>Stakeholder engagement and public participation</i></p>	<p>Active participatory mechanisms are being used in Lao PDR and are an integral part of water management at local scales throughout the whole country.</p>
<p><i>Monitoring progress and compliance</i></p>	<p>There have been advances in the acquisition of technical skills, the development of information systems and of reporting strategies.</p> <p>The capacity of the Lao PDR to manage its own water challenges have given credibility to its commitments in the Mekong agreement and has allowed Laos, in spite of being a least developed country, to improve its position with respect to other national partners.</p>