

# Chapter 4

## Lao PDR Country Report

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# CHAPTER 4

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### Introduction

Laos aims to achieve its ambitious goal of graduating from its Least Developed Country status by 2020. Relatedly, in its seventh National Socio-Economic Development Plan (NSED 2011-2015), the country also targets a growth of above 8 percent. To attain these, one of the main driving forces on the demand side is the surge in infrastructure investment.

Also, the country has been gradually integrating into the world economy through its accession to regional as well as multilateral trade organisations. Lao PDR benefited from opportunities gained from its openness, although there remain several challenges. As a member of the Association of Southeast Asian Nations (ASEAN), for example, it has to deal with the development gap existing between newer members such as itself and the organisation's older members. To reduce such gap between Cambodia, Lao PDR, Myanmar, and Viet Nam (better-known as CLMV countries) and ASEAN's older members,

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the Initiative for ASEAN Integration framework has infrastructure development as one of its four priority areas. The other focus areas are human resource development; information and communication technology; and regional economic integration (ASEAN, 2013).

Development in roads, electricity system, and other public investments will strengthen the supply side of the Lao economy, reduce the predominant reliance on the mining sector, and create more pro-poor growth. However, Lao PDR has a relatively inadequate infrastructure with virtually underdeveloped public water and medical systems. Many rural areas in Lao PDR still have no access to electricity despite the governmental plans to increase national electricity grid. One major obstacle to infrastructure development is the shortage of government budget.

## **Macroeconomic Condition**

Since introducing the New Economic Mechanism (NEM) in 1986, Lao PDR has been transitioning from a centrally planned economy to a more market-oriented one. As a result, except during the Asian financial crisis of the 1990s, Lao PDR has been achieving high economic growth. Economic growth averaged about 8.02 percent over 2006–2011, faster than that in 2001–2005 (6.24%), 1996–2000 (6.17%), and 1990–1995 (6.28%) (Table 4.1).<sup>1</sup> Such rapid growth has enhanced the industrialisation process. Lao PDR' GDP in 2010 was US\$8.3 billion, of which 30.3 percent is from the agricultural sector; 27.7 percent is from industry; and 42 percent is from services. The industrial sector has grown by more than 10 percent since 2002, causing the weight of agriculture in the economy to decline. Population growth gradually decreased from 2.71 percent in 1990–1995 to 1.58 percent in 2001–2005 and to 1.48 percent in 2006–2011.

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<sup>1</sup> The engine of growth during this period was foreign direct investment (FDI) inflows in the mining and hydroelectricity sectors. For a more detailed discussion of the impact of FDI in the mining and hydroelectricity sectors on the Lao economy, see Kyophilavong and Toyoda (2008).

**Table 4.1: Macroeconomic Development in Lao PDR, 1990–2011**

Macroeconomic Indicator	2006-2011	2001-2005	1996-2000	1990-1995
Population (million)	6.07	5.58	5.12	4.49
Population growth (%)	1.48	1.58	2.07	2.71
GDP (current US\$ million)	5,739	2,130	1,617	1,276
GDP growth (%)	8.02	6.24	6.17	6.28
GDP per capita (constant 2000 US\$)	509	371	302	243
GDP per capita growth (%)	6.43	4.58	4.00	3.44
Money supply (M2) (US\$ million)	1,783	409	271	148
Money supply growth (%)	29.87	20.18	66.04	30.92
Inflation, CPI (%)	5.42	10.31	57.00	15.27
Trade balance (US\$ million)*	-320	-228	-276	-174
Trade balance/GDP (%)*	-5.41	-10.43	-17.03	-13.02
Foreign reserve (US\$ million)	875	242	138	54
External debt (US\$ million)	5,140	2,691	2,418	1,960
External debt stocks (% of GDP)	92.81	129.86	152.99	160.25

<b>Macroeconomic Indicator</b>	<b>2006-2011</b>	<b>2001-2005</b>	<b>1996-2000</b>	<b>1990-1995</b>
Budget deficit (including grants, US\$ million)*	-136	-87	-79	-107
Budget deficit/GDP (%)*	-2.53	-4.13	-4.87	-7.95
Budget deficit (excluding grants, US\$ million)*	-357	-125	-142	-152
Budget deficit/GDP (%)*	-6.05	-6.04	-8.88	-11.52
Exchange rate (kip per US\$)	8,885	10,164	4,094	727

*Sources:* World Bank online database ‘World Development Indicators’, available at <http://databank.worldbank.org/data/home.aspx>. \* Asian Development Bank (ADB) online database ‘Key Indicators for Asia and the Pacific 2012’, available at [www.adb.org/statistics](http://www.adb.org/statistics).

With limited physical capital stock and low population growth, labour forces have been increasingly absorbed into the industrial sector, thereby stimulating the productivity growth in the Lao economy, as reflected in the rising real GDP per capita from US\$243 in 1990–1995 to US\$509 in 2006–2011.

Such fast economic growth cannot be achieved without macroeconomic stability. The average inflation rate remained at single digit in 2006–2011, marking a huge improvement over the average inflation of 57 percent during 1996–2000. The exchange rate was similarly stable in 2006–2011. This low inflation rate coupled with stable exchange rate can increase the confidence in the Lao kip (the Lao currency) instead of the US dollar or Thai baht for economic transactions in Lao PDR. Reducing the holdings of foreign currencies is essential if one is to implement an effective monetary policy and to maintain a stable macroeconomy conducive for growth.

Although Lao PDR has been maintaining high economic growth, low inflation and stable exchange rate, serious macroeconomic challenges persist. First, Lao PDR has been dealing with chronic twin deficits in government and trade balances. In 2006–2011, the budget and trade deficit accounted for about 2.53 percent and 5.41 percent of GDP, respectively. The budget deficit is mainly

financed by official development assistance (ODA), while the trade deficit is compensated by foreign direct investment (FDI) and remittances.

With an already weak fiscal situation in Lao PDR, any continued increases in budget deficits could accelerate inflation and lower the value of the kip, potentially leading to the same economic instability experienced during the Asian financial crisis.

Second, there is a huge gap between savings and investment. The savings rate is low because average income is low—GDP per capita was about US\$580 in 2007 (World Bank, 2008)—and financial sectors are underdeveloped. The banking sectors are dominated by state commercial banks, which are not fully performing important banking functions.<sup>2</sup>

Third, Lao PDR also faces a high external debt burden. Accumulated external debt accounted for more than 90 percent of GDP in 2006–2011. If Lao PDR becomes too dependent upon foreign finance, any potential difficulties in meeting its debt obligations can cause an external debt crisis and lead to macroeconomic instability. Rapid expansion of the resource sectors in Lao PDR must therefore be accounted for in the macroeconomic management of Lao PDR.

Fourth, as the Lao economy highly depends only on resources sectors<sup>3</sup>, it will limit the growth of the non-resources sector and will have a negative long-term impact called the “Dutch disease”.

## **Current Infrastructure Condition**

In many ASEAN countries, infrastructure investment has played a major role in fiscal stimulus packages used to mitigate the negative effects of the global crisis. These infrastructure investments have been utilised particularly in key

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<sup>2</sup> More details about financial issues, and monetary and exchange rate policies in Laos are discussed in Kyophilavong (2010).

<sup>3</sup> According to the World Bank (2010), the resources sector contributed about 2.5 percentage points to the growth rate over 2005 to 2010. The resources sector accounted for about 70 percent of all exports in 2010, a share that is expected to increase due to the ongoing development in the hydroelectricity and mining sectors.

sectors such as energy, transportation, information technology and communications (ITC), and water and sanitation. Among other ASEAN countries, the investment demands concentrate in transport and energy infrastructure. Since Lao PDR is a land-locked country, most of the demand is for road infrastructure development projects. However, so is the demand for improving its energy infrastructure high.

The estimation using the “top-down” and “bottom-up” approach from Bhattacharyay (2010) shows that in ASEAN and the Greater Mekong Subregion (GMS)—each of which has Lao PDR as a member—most investment needs concentrate in the power sector. Nearly 60 percent of total national investment needs are in the power sector, followed by the transport sector, the telecommunications sector, and the water and sanitation sector (Table 4.2). Of the total infrastructure investment needs in Asia, energy (electricity) infrastructure comprises 45 percent of the amount, followed by the transport sector, which needs 28 percent primarily for investment in roads development.

**Table 4.2: Infrastructure Investment Needs as a % of Estimated GDP, 2010-2020**

Country	Investment as % of Estimated GDP				
	Transport	Electricity	ITC	Water & Sanitation	Total
Cambodia	4.43	0.95	2.97	0.36	8.71
PRC	1.39	3.42	0.44	0.13	5.39
Indonesia	3.88	0.98	0.97	0.35	6.18
Lao PDR	10.62	0.00	2.40	0.60	13.61
Malaysia	1.94	4.42	0.27	0.04	6.68
Mongolia	12.04	0.00	1.21	0.21	13.45
Myanmar	2.70	0.00	1.46	1.88	6.04
Philippines	2.30	1.87	1.22	0.65	6.04
Thailand	0.58	3.69	0.45	0.19	4.91
Viet Nam	2.07	3.12	2.38	0.54	8.12
<b>Total</b>	<b>1.61</b>	<b>3.22</b>	<b>0.53</b>	<b>0.17</b>	<b>5.54</b>

*Source:* Bhattacharyay, B. (2010), and Centennial (2009).

Bhattacharyay (2010) also finds that in the GMS subregion specifically, the need for more investment is in the transport, followed by the energy sector. In the case of Lao PDR, the investment need in transport infrastructure (particularly the road sector) is about 10.62 percent of the estimated GDP during the period 2010-2020 as shown in Table 4.2.

## 1.1. Road

### 1.1.1. Current Road Situation

The road network in Lao PDR has expanded significantly in the last two decades—from 14,000 km in 1990 to 44,005 km in 2012 (Table 4.3), averaging around 1,824 km per year (or 4.6%). Tarred roads increased to 6,896 km (about 7%) annually. Despite this significant expansion, most remote parts of the country still have no dry or wet season access. In other words, although 56 percent of the national roads are paved with a bitumen surface, around 30 percent of rural villages remain inaccessible and depend on earth roads, which are often impassable during the wet season.

**Table 4.3: Length of the Roads for the Whole Country (Unit: Km)**

Items	2006	2007	2008	2009	2010	2011	2012	Share
Total Length of the roads	35,260	36,831	37,194	39,569	41,492	41,949	44,005	100
Growth (%)		4.5	1.0	6.4	4.9	1.1	4.9	
Concrete roads	N/A	N/A	N/A	34	83	97	141	0.32
Asphalt concrete roads	N/A	N/A	N/A	496	614	684	725	1.65
Tarred roads	4,548	4,811	4,739	4,882	5,324	6,603	6,896	15.67
Gravelled roads	11,981	12,572	13,128	13,864	14,556	14,142	15,324	34.82
Earthen roads	18,731	19,448	19,327	20,293	20,915	20,423	20,919	47.54

*Source:* Ministry of Communication, Transport, and Construction.

Roads in Lao PDR remain wanting as a result of, to a large extent, the insufficient investment in rehabilitation and maintenance of the roads network, implying its hard constraint on the national poverty reduction objective (Australian Government, 2012).

At present, the Lao government has been receiving financing support from various sources such as US\$27.8 million from the International Development Association (IDA), US\$1 million from the co-financing initiative of the Japanese government agency called Policy and Human Resources Development (PHRD), US\$8 million from the Lao government's Road Maintenance Fund (RMF), and US\$6.38 million from the regular annual government budget. These funds will be used for the Lao Road Sector Project (LRSP) activity during the project life period 2010-2014. The project consists of three main components: Road Network Improvement and Preservation, Institutional Strengthening, and Disaster Recovery and Contingency (Australian Government, 2012).

The types of transportation in the country have been increasing, as can be inferred from Table 4.4, partly thanks to projects that promote travel. Among the country's completed transportation infrastructure projects are: (1) the construction of a friendship bridge that links Savannakhet province of Lao PDR to Moukdahan province of Thailand; and (2) Road No.1 in Vientiane Capital. Likewise, the 3-km Dongposy-Thanalang railway has been constructed. Important roads, including R3 Road (Boten-Huaysay), Road No. 9 (Savan-Seno), and Road No. 12 (Thakek-Ngommalath), have been operational while some projects are in various stages of construction. These ongoing projects include Road No. 2W (Ngeun district-Pakbang district) (91% complete), Road No. 15B (Saravan-Lao-Viet Nam border) (49% complete), Mekong river bridge (Thakek-NakonPhanom) (40% complete), Road No. 2E (Kwa-Thaichang) (31% complete), and Road No. 14A (Pakse bridge-Lao-Cambodia border). In addition, Savannakhet Airport has been reopened, and about 81 percent of the upgrade of the Pakse Airport has been finished (MPI, 2010).

An example of a successful road project is one supported by the Australian government. Here, the number of people with road access reached 7,206 (1,148 households and 3,595 women), along with an increase in rural employment opportunities (Australian Government, 2012).

**Table 4.4: Freight Transport by Categories of Transport (unit: thousand tons)**

Years	Total	Growth (%)	By land	By water	By sea	By air
1990	667.9		551	106	10.3	0.5
1995	1,470.2	120.1	950	476	43	1.2
2000	2,308.5	57.0	1,635	672		1.5
2001	2,283.4	-1.1	1,543	739		1.4
2002	2,750.9	20.5	1,946	770	33	1.9
2003	3,068.5	11.5	2,174	893		1.5
2004	4,043.4	31.8	3,102	940		1.5
2005	3,213.7	-20.5	2,592	621		0.7
2006	3,307.6	2.9	2,709	598		0.6
2007	4,089.4	23.6	3,322	767		0.4
2008	4,542.6	11.1	3,659	883		0.6
2009	4,668.4	2.8	3,707	961		0.4
2010	5,820.2	24.7	4,730	1,088		1.6

### 1.1.2. Road Investment Financing

As infrastructure projects are public goods in nature and have significant externalities for society, funding through national government budgets is usually the mainstay in infrastructure financing. Traditionally, national government budgets have been the predominant source of funding for infrastructure investments and services in the country.

In past years, Lao PDR has made its best efforts to finance road maintenance projects starting with 106 billion Kip in 2005–2006, and increasing to 270 billion Kip by 2009–2010. Nonetheless, it was still far from meeting the actual demand in terms of number of roads, and many roads continue to be left in disrepair (MPWT, 2013). Furthermore, several evidences show that the delays in some projects were mainly due to inadequate funding. Therefore, the government's first priority will be to preserve the existing condition of operational roads, particularly national roads, by providing sufficient funds (ADB, 2010b).

To attain the above objective, external supports is vital for such less developed country as Lao PDR. In addition to the central budget allocations, most of the infrastructure development projects in Lao PDR are supported by donors, development banks, and other financing institutions that channel funds towards developing the transportation system.

Data collected from MPWT (2013) indicate that the potential funding sources for upcoming infrastructure development are either domestic funding sources (recurrent state budget, National Road Maintenance Fund, equitisation of asset, and Nam Theun 2 Hydro Plant revenues) or funding from development partners.

The first domestic funding comes from the annual investment budget. This has two sources: those from the annual state budget of the Ministry of Public Works and Transport (MPWT) and those from the annual provincial budget received from the government. The state budget allocation is estimated at 1,600 billion Kip for FY 2014-2015.

The second domestic fund source is the National Road Maintenance Fund (RMF). Created under the Road Maintenance Project (RMP) in Lao PDR, the fund is supported by the levy on fuel, which is its main revenue, and by heavy vehicle surcharges, overweight fines, bridge tolls, and international transit fees (ADB, 2010b).

The RMF allocates 90 percent of its revenues to national roads. The fund heavily depends on aid from development agencies, which currently forms 65 percent of the overall funding. Table 4.5 shows the funding sources in the case of the Lao Road Maintenance Project 2.

**Table 4.5: Summary Lao PDR Road Maintenance Project 2**

Aid Activity Name	Lao PDR Road Maintenance Project 2		
Aid Works initiative number	INH714		
Commencement date	4 February 2008	Completion date	31 December 2010
Total Australian \$	2,800,000	(2.5%)	
Total other US\$	1,000,000	(ADB loan: 1.5%)	
	24,392,100	(World Bank: 37%)	
	4,800,000	(Japanese PHRD: 7%)	
	11,060,000	(SIDA: 17%)	
	23,500,776	(Road Maintenance Fund-Lao Government: 35%)	
Delivery organisation	The World Bank		
Implementing partner	The Ministry of Public Works and Transport		
Country/Region	Lao PDR/South East Asia		
Primary Sector	Transport		

Source: Melhuish (2010).

Although RMF has covered only 40 percent of the needs, it has still been deemed a “well-performing fund”. It has had a significantly favourable impact on revenue generation, earning a total income of 16 billion Kip (about US\$1.9 million) in its first year. In 2008-2009, its revenue even rose significantly to 207 billion Kip (about US\$24.4 million). The income is estimated to reach 605 billion Kip (about US\$71.2 billion) by 2015 (Melhuish, 2010).

The third source of domestic funding is from the equitisation of assets. Currently, the government promotes both domestic and foreign investment in road network development in such sectors as industry, agriculture, mining, and energy. Although the revenue from this source is yet to be estimated, there are initially 22 projects in the technical preparation phase and/or fund mobilisation phase, out of which three projects pertain to bridges across the Mekong River measuring 2,060 km long.

The fourth source of domestic funding is the electricity sale revenues generated from the Nam Theun 2 Hydropower plant. About 30 percent of this hydropower plant's total revenue has been annually allocated to local road maintenance. For FY 2014-2015, the contribution from this source is estimated to increase to 200 billion Kip.

Development partners, too, are significant contributors to the Lao transport sector. Since 1984, the sector has received about 10,800 billion Kip for road and bridge development from international development partners. For FY 2011-2015, the funding from this source will be about 25,118 billion Kip.

At present, Lao PDR has cultivated good relations with its neighbouring countries, fellow ASEAN members, and Western powers, which had contributed to a satisfactory inflow of both Official Development Assistance (ODA) and foreign direct investment (FDI) as well as helped regional security. It is worthy to note that the bulk of financing for infrastructure projects in Lao PDR not only comes from the public sector, but from ODA predominantly. Lao PDR has in fact been highly dependent on ODA, especially in financing new physical infrastructure projects and upgrading existing ones (BTI, 2012). In 2007-2008, for example, 73 percent of the US\$78.59 million of total public investment for roads was from external agencies in various forms such as grants, soft loans, and long-term loans (ADB, 2010b).

Most ODA for infrastructure projects comes from Japan and multilateral lenders such as the Asian Development Bank (ADB), Nordic Development Fund, Swedish International Development Cooperation Agency (Sida), and the World Bank. In particular, the last three of the above-mentioned supporters are the main providers of assistance in the Road Maintenance Programme (ADB, 2010b).

Japan is the largest ODA donor to Lao PDR, contributing about US\$109 million in 2010, while international financial institutions ADB and World Bank provided US\$65 million and US\$48 million, respectively. Since their assistance specifically to Lao PDR's transport sector is likely to be sustainable based on an assessment of government's financing of recurrent costs, institutional arrangements, cost recovery of projects, and the past experience on road maintenance in the country, ADB and World Bank are two of the lead development partners for the road subsector and, in fact, effectively co-chairs the infrastructure working group in Lao PDR (ADB, 2010b). Based on the Asian Development Fund (ADF) policy, for example, ADB provides 100-percent grants, mainly for infrastructure development projects, to Lao PDR to help reduce the burden on the latter's national budget (World Bank, 2008).

As an individual source of assistance, Australia is estimated to be the fourth largest donor with its total ODA estimated at around US\$43 million in 2011-2012. Further bilateral aid also comes from other friendly countries such as China, Korea, Thailand, and Viet Nam, albeit on a smaller scale (Australian Government, 2012). For example, after the railway from Nongkai province, Thailand, to the Lao-Thai Friendship Bridge was completed, both the Lao and Thai governments had already agreed to construct a 3.5-km railway from the middle of the bridge to Thanaleng, Lao PDR. This will be funded by the Thai government for US\$4.9 million, of which 30 percent is in the form of grant, and 70 percent is soft loan (Oraboune, 2008).

Another source of road financing is the fund from the Pre-Investment Project. In 2001, the Pre-Investment Study laid out a pragmatic and sector-focused strategy and action plan to transform the East-West Economic Corridor (EWEC) of the Greater Mekong Subregion (GMS). The study proposed a total of 79 policy, project, programme and institutional initiatives, divided according to high-, medium- and low-priority levels. The high-priority initiatives consisted of these six core strategic thrusts (Lord, 2009):

- Spatial planning and physical infrastructure improvements to create the basis for realising East-West Economic Corridor concept;
- Policy and procedural simplification to reduce barriers to the efficient cross-border movement of goods and services;
- Support programmes to enhance the capabilities of enterprises of the EWEC to engage in regional trade and co-investment;
- Capital and financing for projects to support the EWEC concept;
- Skills development to upgrade the capabilities of EWEC residents and businesses, and to enhance long-term competitiveness of the EWEC;
- Institutional development to upgrade the capabilities of local-level bodies to sustain cooperation.

The fourth priority listed above, which pertains to capital and financing, presents an opportunity for Lao PDR, as a member of the GMS, to be a financing recipient since it has important linkages with other member countries. Take for example the Vientiane-Bangkok Route Intersection Node, which links Bangkok with the northeast of Thailand and Vientiane of Lao PDR, and the multi-lane Highway 209 of the EWEC. The Thai government had endorsed it as the principal export centre in the Indo-China region. In addition, in 2008, the prime ministers of two GMS members, Lao and Cambodia, met to discuss their need for a transit transport and the mechanisms that would provide Lao PDR greater access to Sihanoukville Port and facilitate trade. Implementation of this transit and trade facilitation arrangements would significantly impact the commerce along National Road No. 13 (Lord, 2009). That is, these interchange nodes link east-west trade with north-south trade, and the transportation network can produce significant increases in traffic flows.

## **1.2. Hydropower/electricity**

### *1.2.1. Current Hydropower Development*

Lao PDR, historically one of the poorest countries in Asia and the Pacific region, has made impressive progress in developing its economy and reducing poverty, thanks to the development of its mining and hydropower sectors. The average 7-percent annual GDP growth helped halve the share of the population that is below the national poverty line to less than 25 percent (IMF, 2011).

Lao PDR possesses abundant energy resources with less environmental impact. Its hydropower facilities cover 97 percent of all its electricity sources (ADB, 2006). The hydropower plant in the Greater Mekong River Basin has been recognised as the most abundant and cost-effective natural source for electricity generation. As reported by the Department of Energy Promotion and Development, the country is endowed with a hydroelectric potential of about 26,500 MW, excluding the mainstream Mekong. Of the potential, about 18,000 MW is technically exploitable, with 12,500 MW found in the major Mekong sub-basins, while the rest are in minor Mekong or non-Mekong basins.

The exploitation of hydropower for electricity export is at the heart of the Lao government's strategy to earn foreign currencies so as to support the country's development. Being at the hub of the Greater Mekong Subregion (GMS) and its substantial hydropower potential, Lao PDR has a strategic role in realising the economic, environmental and sectoral benefits of electricity trading in the subregion.

Despite the tremendous hydropower potential, only 10 percent has been developed in over 30 years. Very few households, particularly in rural areas, have access to electricity, implying an obstacle to the socio-economic development. To ensure an adequate supply of electricity for domestic demand as well as for export to other countries in the region, the Lao government has aimed to provide electricity to at least 70 percent of the entire households by 2010, and 90 percent by 2020. Its efforts would require increasing the number of power plants in the country by promoting more investment in this sector. Table 4.6 shows the gradual increase in power plants in the country today while Table 4.7 indicates the forecasts for domestic demand for electricity.

**Table 4.6: Existing Power Plants in Lao PDR**

No	Project Name	Inst. Cap (MW)	Annual Energy (GWh)	Compl. Years	Regions
1	Nam Mang-3	40	147	2005	C1
2	Xeset-2	76	309	2006	S
3	Xepon	75	301	2008	C2/S
4	Nam Ngum-2	75	275	2008	C1
5	Nam Ngum-5	100	430	2009	C1/N
6	Xeset-3	20	85	2010	S
7	Hoauay Lamphan	60	354	2010	S
8	Nam Ngum 4B	56	254	2011	N

No	Project Name	Inst. Cap (MW)	Annual Energy (GWh)	Compl. Years	Regions
9	Nam Beng	45	175	2012	N
10	Tha Kho	36	215	2013	C1
11	Nam Bak 2B	116	563	2012	S
12	Vieng Phoukha	50	263	2014	N
13	Nam Pot	23	97	2015	C1
14	Nam Sim	7	24	2015	N
15	Nam Kong 3	25	142	2016	C1
16	Nam Long	11	53	2016	C1
17	Nam Ngum 4A	55	250	2017	C1
18	Nam Sane2	62	279	2018	C1
19	Xexou	59	277	2019	S
	Total Plan	991	4,493		

Note: N: North, S: South, C1: Central-1, C2: Central-2

Source: Electricite du Lao PDR, 2003.

**Table 4.7: Forecast on Domestic Electricity Demand for the Whole Country (MW)**

	Year	Demand	Supply	Balance
Need to Import	2011	786	579	-207
	2012	1,021	786	-235
	2013	1,165	859	-306
	2014	1,419	1,161	-258
Excess Electricity to Be Exported	2015	2,083	2,349	266
	2016	3,180	6,851	3,670
	2017	3,290	7,342	4,052
	2018	3,401	8,298	4,897
	2019	3,403	8,473	5,070
	2020	3,488	8,737	5,249

Source: *Electricité du Lao PDR (EDL, 2012)*.

The development of hydropower-based generation facilities is open to foreign investment from many international firms. Currently, hydropower development is the most attractive investment project whose concession agreement is mostly under a Build-Operate-Transfer (BOT) scheme. This type of concession gives investors a long-term return on their investment (IPD, 2010).

Also, under the seventh National Socio-Economic Development Plan for 2011-2015, the Lao government intends to build 10 more hydropower plants that have a capacity to generate about 5,015 MW of electricity (Liyong, 2012). Independent power plants (IPPS) and several medium-sized IPP projects had been nominated to participate so as to meet the increasing demand in the

country as well as from neighbouring countries, especially Thailand and Viet Nam.

Lao PDR has been exporting surplus power from its Nam Ngum Hydropower Plant to Thailand ever since the said hydropower plant was commission in 1972. Later, a memorandum of understanding (MOU) on 4 June 1993 between the two countries that required 1,500 MW of electric power in Lao PDR to be developed by year 2000 and exported to Thailand—along with Lao PDR' new foreign investment policies—paved the way for private sector participation in the development of Lao PDR' electricity for export.

The Theun-Hinboun hydropower project was the first to be implemented under the MOU and the first major investment under the new foreign investment policies of Lao PDR. Except for a small supply that goes to nearby local areas, much of the project's electricity was produced for export to Thailand (ADB, 2010). In addition, Thailand is likely to gradually increase its import of electricity from Lao PDR given that much of the expansion projects in Lao PDR mostly come from hydropower-based plants, which have less environmental issues. Such environmental benefit applies not just to Lao PDR, but also helps Thailand in reducing its carbon dioxide (CO<sub>2</sub>) emission.

Meanwhile, the Nam Theun 2 hydroelectric project (NT2), which began its commercial operation in March 2010, is the largest of its kind in Lao PDR so far. It is capable of producing 1,070 MW of electricity and generating US\$235 million worth of gross revenues from yearly sales to Thailand. Note that Thailand, which accounts for about 90 percent of Lao PDR' total electricity exports, is Lao PDR' biggest importer. However, since NT2 is unable to accommodate the significant demand, other power plants have been considered to serve both the domestic consumption as well as the demand from Thailand.

There are five other projects where the Lao government had agreed to export electricity to Thailand and will benefit from in terms of export revenues (Phomsoupha, 2009). In addition, the new 1,280 MW Xayaburi Dam in the northern part of the country, a run-of-river hydropower project on the Mekong River, is under construction. This first mainstream project will be one of the largest hydropower plants in Lao PDR with more than 90 percent of its generated electricity to be exported to Thailand (ESI, 2012).

### *1.2.2. Electricity Accession*

Since most of the total electricity generated in Lao PDR is to be exported to Thailand, only around 10 percent will serve domestic demand. In addition to the independent power plants (IPPs), several medium-sized IPP projects have been nominated to supply electricity for domestic use (Watcharejyothin and Shrestha, 2009).

According to Watcharejyothin and Shrestha (2009), the urbanisation rate in the country is estimated to gradually rise from 22 percent in 2005 to 36 percent by 2035. Likewise, the forecasted electrification rate in rural area will increase from 33 percent in 2005 to 95 percent by 2035. Domestic demand for electricity in Lao PDR has been growing very fast in line with the government's poverty reduction plan on rural electrification (although still very low when compared with the consumption levels in other ASEAN countries). The demand largely comes from mining, manufacturing, and business (EDL, 2010).

The average growth of electricity consumption is expected to be high due to two main reasons:

- The increase in the number of Electricité du Lao PDR (EDL)<sup>4</sup> customers after the transmission and distribution network system was expanded and electrification ratio grew; and
- Rise in per-capita energy consumption because of changing lifestyles.

According to EDL (2012), the utility company that owns and operates transmission and distributions system in Lao PDR, the forecasted average growth rate in energy demand for the whole country from 2006 to 2020 is about 13 percent while peak load is at 11 percent. Currently, more than 70 percent of the Lao people nationwide have access to electricity following the EDL's execution of the 8<sup>th</sup> Party Congress' resolution to improve electrification. The key drivers for the improvement of electrification include:

- Sustained national commitment with substantial financial support from the Lao government;

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<sup>4</sup> EDL is the state corporation of Laos that owns and operates the country's electricity generation, electricity transmission, and electricity distribution assets in Laos.

- Utility-driven, grid-based electrification complemented by an off-grid programme;
- Substantial financing platform;
- Programme planning and prioritisation to maximise social benefits, targeting the poor and ascertaining sensitivity to social differences such as gender; and
- Reduction in investment and operating costs (Milattanapheng, 2012).

Lao PDR also imports some amount of electricity from its neighbouring countries—namely, Thailand, Viet Nam, and China—to accommodate its increasing consumption of electricity, especially in the rural areas. For Lao PDR, importing is a cheaper alternative than having to extend its national grid to each corner of the country (i.e., where the 22 kV transmission lines cost between US\$10,000 and US\$15,000 per kilometre, depending on the accessibility of the road). However, as shown in Table 4.7, Lao PDR will have adequate electricity to meet domestic demand by 2015, and still have surplus electricity available for export.

Because of higher consumption, the government is working to increase the electrification ratio from the current 70 percent to 90 percent by 2020 (MEM, 2011). With support from small hydropower facilities (i.e., those with capacity of up to 15 MW), increasing the electrification ratio of the whole country will be achieved through:

- **On-grid household electrification** - involves main transmission/distribution grid extensions to meet the 90 percent target, after deduction of off-grid installations.
- **Off-grid household electrification** - an embryonic but successful programme of electrification of off-grid households employing state, donor and private resources. The programme targets electrification of 150,000 households by 2020 and, if successful, will be substantially scaled-up.

### *1.2.3. Hydropower Investment Financing*

The operational efficiency and financial viability of utility company EDL have improved remarkably over the past years as a result of the implementation of the power sector's financial sustainability action plan (World Bank, 2011).

However, many hydropower projects in Lao PDR still rely on foreign financial support (Table 4.8) due to insufficient domestic financing. The number of hydropower plants entirely financed by domestic investors is relatively limited. Although Xeset2 was entirely financed by EDL, it only has a 76-MW generation capacity (Table 4.9). In addition, the expansion of electricity networks and substations in rural areas (with 37,000 rural households in central and southern parts of Lao PDR expected to benefit from reasonably priced electricity for the first time by 2013) was made possible through a US\$15 million loan extended by the International Finance Corporation (IFC, 2012).

**Table 4.8: Power Projects Under Construction**

Projects	Capacity (MW)	Financing Source		Operation Year
Xe Kaman 3	250	EDL of Lao PDR	15%	2012
		Viet-Lao PIDJS of Viet Nam	85%	
Nam Ngum 5	120	Sinohydro Corporation of China	95%	2011
		EDL of Lao PDR	5%	
THPP-Expansion	280	Nordic Hydropower of Sweden/Norway	20%	2012
		MDX/GMS of Thailand	20%	
		EDL of Lao PDR	60%	
Hong Sa	1,800	Ban Pu of Thailand	45%	2014
		Ratchaburi of Thailand	35%	
		LHSE of Lao PDR	20%	
HouayLamphanGnai	88	EDL of Lao PDR	100%	2014
Nam Khan 2	127	EDL of Lao PDR	100%	2014
Xekaman 1	468	Viet Nam	100%	
Namsan	14	EDL of Lao PDR	100%	
Nam Ngiep 2	180	EDL of Lao PDR	100%	

Source: EDL (2012).

**Table 4.9: Power Projects Completed in Year 2009-2010**

Projects	Capacity (MW)	Financing Source		Operation Year
Nam Theun 2	1,088	EDFI of France	35%	2009
		EGCO of Thailand	25%	
		ITD of Thailand	15%	
		LHSE of Lao PDR	25%	
Nam Ngum 2	615	C. Kanchang of Thailand	28.5%	2011
		EdL of Lao PDR	25%	
		Ratchaburi of Thailand	25%	
		Bangkok Express Way of Thailand	12.5%	
		Shlapak Group of USA	4%	

Projects	Capacity (MW)	Financing Source		Operation Year
		PT Construction of Lao PDR	4%	
		TEAM of Thailand	1%	
Xeset-2	76	EDL of Lao PDR	100%	
Nam Lik 1-2	100	CWE Corporation of China	90%	2010
		EDL of Lao PDR	10%	

Source: EDL (2012).

## Policy Framework on Infrastructure Investment

Article 49 of the 2009 amended Investment Promotion Law No. 02/NA lists agriculture, industry, handicraft and services as Lao PDR' promoted sectors. Detailed lists of remote activities will be categorised by the government into three different levels based on priorities. Furthermore, Article 50 of the law specifies three zones for investment promotion based on the socio-economic infrastructure and geographical conditions of the country as follows:

- **Zone 1:** mainly mountainous remote areas, where there is insufficient socio-economic infrastructure to facilitate investment.
- **Zone 2:** geographic isolation in this zone is not as severe as in zone 1. Socio-economic infrastructure is still able to facilitate investments to some extent. The zone is classified as a medium level of investment promotion.
- **Zone 3:** has good infrastructure available to support investments. This zone is classified as a low level of investment promotion.

Moreover, the duration of the profit tax exemption given as an investment incentive shall be implemented based on zones and investment promotion levels, as shown in Table 4.10.

**Table 4.10: Profit Tax Exemption**

<b>Investment Promoting Zone</b>	<b>Level of Investment Promotion</b>		
	Level 1	Level 2	Level 3
Zone 1	10 years	6 years	4 years
Zone 2	6 years	4 years	2 years
Zone 3	4 years	2 years	1 year

*Source:* National Assembly (2009).

To improve its investment climate, the Lao government has been progressively reforming its trade facilitation since 2005 with support from a number of international agencies. As a result, there are now more than 20 active investment projects supported by both multilateral and bilateral donors, including ADB, Australia, the European Community, France, Japan, New Zealand, Singapore, the Netherlands, Sweden, United Nations Development Programme, and World Bank. The reforms include stimulating public investment to strengthen the supply side of the economy; reducing reliance on the mining sector; and creating more balanced growth (World Bank, 2011).

The framework for public investment, and sector and cross-sectoral planning is based on the five-year National Socio-Economic Development Plans (NSEDPs) whose central themes are economic growth, poverty reduction, and sustainable environmental management (IFAD, 2011). As stated in the seventh NSEDP, the target private investment is 64 percent (FDI: 54%, domestic credit 10%) of total investment (US\$7.4 billion); the rest will be from donors and development partners (26%), and government budget (10%).

To achieve the goals stipulated in the NSEDP, the government itself has been actively allocating a large amount of its budget into public investment. Among others, 35 percent of total investment of US\$15 billion (about 32% of the GDP) will be allocated to the infrastructure sector during the seventh NSEDP from 2011 to 2015 (MPI, 2010). Meanwhile, 35 percent and 30 percent will be allocated to the social sector and economic sector, respectively. The government will also exert effort to increase its total revenue to at least 18 percent to 20 percent of GDP. To regulate finances and mitigate the impact of external factors, the government aims to closely implement a new Budget Law and other financial regulations.

Today, the infrastructure sector has been further promoted by a number of infrastructure-related mega projects in the country<sup>5</sup>. In fact, there are 21 groups of selected mega projects specified in the seventh NSEDP.

As mentioned earlier, Japan is the largest source of bilateral assistance for Lao PDR, followed by France, Sweden, and Germany. Meanwhile, ADB is its largest source of multilateral funding. In addition, ODA has contributed about 85 percent of public investment programmes in 2008 (IFAD, 2011).

Infrastructure projects in specific sectors such as transportation are also considered the heart of the country's economic development. Over the past 15 years, a high percentage of government's public investment has been concentrated on rebuilding the road system with impressive results. The entire road network in the country amounts to about 32,600 km, consisting of 7,160 km of national roads, 8,950 km of provincial roads, 6,620 km of district roads, and an estimated 9,800 km of community and access roads. Recent investment has been devoted to the upgrade of the arterial road network, notably NR13.

Regional connectivity is also a core of Lao PDR's trade with neighbouring countries. Its so-called "land-linked" strategy involves turning from a land-locked to a land-linked country through the corridors at the fringes of Lao PDR, thereby allowing it to benefit from regional and subregional infrastructure development projects of the Greater Mekong Subregion (GMS), the Association of Southeast Asian Nations (ASEAN), Triangle Development Area, and a number of cooperation programmes (Oraboune, 2008). Moreover, the government of Lao PDR is working to make the country a centre for logistics for the GMS, confident that the ongoing road networks projects can prepare the nation for international linkages, particularly in the subregional north-south and east-west economic corridors.

Among the international linkages commenced between Lao PDR and neighbouring countries is the Northern Economic Corridor (NR3) that connects Thailand via Lao PDR to China. In 1997, it used to take three days for goods to move across one 270-km section of dirt track along the corridors of Lao PDR. Today, thanks to a US\$90 million project equally funded by ADB, China, and Thailand, the same trip takes only four hours, even with a large increase in

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<sup>5</sup> According to the 7<sup>th</sup> NSEDP, a mega project is a project or group of projects with a direct cost of US\$50 million.

commercial traffic (ADB, 2009b). Another key international linkage is the east-west links that connects Western Lao PDR and Thailand to the border with Viet Nam (NR6 and NR7) (MONRE, 2012).

Electricity is also a vital infrastructure to promote sustainable development. From a net electricity importer, Lao PDR has become a net electricity exporter and is even on the way to becoming a regional electricity supplier due to its abundant hydropower potential. As a source of revenue from exports to neighbouring Thailand and Viet Nam, the development of large hydropower facilities in Lao PDR is getting attention from foreign investors (Bounthongvongsaly, *et al.*, 2010).

Thus, the energy sector can facilitate the National Growth and Poverty Eradication Strategy's (NGPES) aim for Lao PDR to transition out of the Least Developed Country category by 2020. To achieve the national poverty eradication goal via energy development, the salient objectives of the energy sector for 2020 are as follows (ADB, 2010a):

- Expanding access to low-cost, reliable, and sustainable electricity;
- Earning foreign exchange by tapping the country's rich hydropower potential; and
- Becoming the battery of the GMS.

Given its ambitious plan to become a battery of GMS and to integrate the hydropower system within the GMS, the Lao government invested in high-voltage (230 kV and 500 kV) transmission systems (ADB, 2010a). Through the GMS power grids, Lao PDR will benefit from power interconnection with neighbouring countries in terms of higher electricity exports, improved relationship between Lao PDR and other GMS member countries, and enhanced investment climate. About 12,500 MW (or 60,000 GWh) of electricity generated using clean and renewable hydropower from Lao PDR will further help reduce 30-60 million tons of carbon dioxide emission yearly, bringing an annual savings of about five million tons of fossil fuels in the subregion (Thoummavongsa and Bounsou, 2013).

The hydropower sector is thus both a national and regional priority. With its rivers contributing about 35 percent of the Mekong flows and its strategic location between the booming economies of China, Viet Nam, and Thailand,

Lao PDR is uniquely situated to provide hydropower to both domestic and regional markets (ICEM, 2010). A number of hydropower dams have thus been built on the Lower Mekong River located in Lao PDR.

Recently, the four governments of the Lower Mekong River (Cambodia, Lao PDR, Thailand and Viet Nam) revived plans from the 1950s to build 11 hydropower plants in the region, of which nine would be located in Lao PDR (ESI, 2012). Altogether, the national vision is to build 103 hydropower plants, of which 10 plants on the Mekong River's tributaries have already been in operation, eight under construction, and 82 under licensing or in planning stages nationwide, accounting for more than 20,000 MW (ICEM, 2010) of electricity.

Plans now include finding grants or concessionary loans, investments from private sectors, and individual independent power producers (IPPs) that may be needed at the initial stages of the interconnections (Thoummavongsa and Bounsou, 2013).

## **Issues and Challenges in Infrastructure Development**

There are high demands for infrastructure in Lao PDR but the supply side (financing) is limited and beset by issues and challenges. First, government lacked funding for infrastructure development, leading it to resort to external sources for loans and grants. Second, based on its large budget deficits and external debts, it seems that government has over-financed infrastructure such that it led to macroeconomic instability. In addition, the monetary authority used reserves to finance road projects in 2007-2010. Third, as the State-Owned Commercial Bank (SOCB) financed most pre-investment projects for road construction, ineffective infrastructure financing mechanisms can lead to more non-performing loans and higher costs for projects. Fourth, inappropriate infrastructure financing can lessen the creditor's credibility in the eyes of international bank and international donors. As a consequence, Lao PDR may have difficulty getting loans from international agencies for future projects.

There are issues on road financing in particular. First, the budget from the government for road construction is wanting. Second, because government has

limited budget, it resorts to a financing mechanism called “pre-investment”, wherein it allows domestic private investors to build the road first and then pays them back for the debt at a later time. Meanwhile, the domestic investors with limited funding mainly resort to the SOCB for loans guaranteed by the government. This funding mechanism may increase the bank's non-performing loans and therefore carries risks on the nation's macroeconomic stability.

Meanwhile, in hydropower electricity generation projects, most investments are in the form of FDIs simply because Lao PDR' local financial market is not yet sophisticated enough to offer other forms of domestic financing. Thus, there too are issues on FDI-funded projects. First, despite having an investment law, Lao PDR has poor implementation and supporting regulations. For one, agreements between FDI stakeholders and the government are negotiated. Because the Lao government has limited knowledge and capacity on contract negotiations, it may have difficulty in eliciting the optimal, or at least mutually advantageous, benefits out of the deals. Second, the massive FDI flows in hydropower electricity generation projects will appreciate the real exchange rate, lowering export competitiveness in other sectors such as agriculture and industry in a phenomenon called the Dutch Disease. Third, hydropower electricity generation projects bring with it environmental, natural resource and social issues, particularly because most of the Lao people who live in rural areas generate income from fishery and non-timber forest products.

## **Financing Infrastructure Option**

### **1.3. Road**

#### *1.3.1. Public-Private Partnership*

In Lao PDR, the bulk of financing for new and upgraded road projects mostly comes from the public sector and Official Development Assistances (ODAs). However, since infrastructure development is a long-term process that requires a strong coordination mechanism, the private sector can contribute substantially to the infrastructure projects in Lao PDR through a public-private

partnership (PPP)<sup>6</sup>. As pointed out by the Minister of Public Work and Transportation, 7,000 billion Kip (almost US\$900 million) is needed for road development until 2015. Such amount is beyond the country's budget. To cover the gap, new ways such as the PPP may support investments in infrastructure development (Queiroz, 2012).

According to ADB (2009a), Lao PDR has actively supported PPPs. There are now five projects considered as PPPs, of which four are in the power sector and one is in the road sector. A World Bank assignment was carried out in Lao PDR to assess the initial feasibility of potential PPP projects for roads as well as to set the groundwork for a pipeline of potential PPP projects in the road sector. This mission also identified and worked to adopt best practices in the use of PPP in Lao PDR such as:

- Training on the financial assessment of PPP projects;
- Applying the newly acquired training skills in the actual preliminary financial assessment of two pilot PPP projects;
- Training in the use of Road Network Evaluation Tool (RONET), an excellent tool that helps identify a pipeline of potential PPP projects on an existing road network;
- Conducting PPP survey of key stakeholders; and
- Organising and participating in PPP workshops and technical discussions, including those on measures to improve the use of performance-based contracting (Queiroz, 2012).

In the brief PPP survey carried out in 2012, Queiroz (2012) found that Build-Operate-Transfer (BOT), Rehabilitate-Operate-Transfer (ROT), and performance-based contracts are forms of PPP with better potential in road

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<sup>6</sup> In Laos, a public-private partnership (PPP) is a government service or private business venture that is funded and operated through a partnership of government and one or more private sector companies. The scheme involves a contract between a public sector authority and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project. In projects that are aimed at creating public goods in the infrastructure sector, the government may provide a capital subsidy in the form of a one-time grant, so as to make it more attractive to private investors. In some other cases, the government may support the project by providing revenue subsidies, including tax breaks or by removing guaranteed annual revenues for a fixed time period.

projects in Lao PDR. The survey also indicated that the stakeholders interviewed were optimistic about the PPP pilot projects in the road sector, which implied that they find the PPP projects feasible in Lao PDR.

Furthermore, representatives from such agencies as the Ministry of Finance, Ministry of Energy and Mines, Ministry of Planning and Investments, Ministry of Natural Resources and Environment, Prime Minister Office, and Ministry of Public Work and Transportation were likewise positive about the prospects of PPPs. One of the operational PPPs in the road sector pertains to the ThaNgong Bridge project. The study also found two potential PPP projects in the road sector: the Road 13 North (100 km) and Road 13 South (66 km).

### *1.3.2. ASEAN Infrastructure Funding*

Another notable source to finance the road sector in Lao PDR is the so-called ASEAN Infrastructure Fund (AIF). With ADB as its shareholder, co-financier, and administrator, the AIF was established in 2011 to mobilise financial resources within ASEAN in support of regional physical infrastructure development, particularly in priority areas that include the transport, communication, energy, and water sectors. The AIF will have an equity of US\$485.2 million, of which a total of US\$335.2 million (69.08%) will come from ASEAN countries and US\$150 million (30.92%) will be from ADB. With some help from its co-financiers, the AIF plans to leverage more than US\$13 billion in infrastructure financing by 2020 (Rhee, 2013).

Also, its US\$500 million is part of the overall regional budget for infrastructure assistance to less developed ASEAN members (Chheang and Wong, 2012), and Lao PDR is qualified as a recipient. This support will benefit the country's road development, although Lao PDR has to exert some effort to secure the funding given that the overall budget is not big enough to address all infrastructure needs of all member countries.

## **1.4. Hydropower**

### *1.4.1. Public-Private Partnership (PPP)*

As the demand for energy across the country substantially exceeds the governments' abilities to pay for it, private investment is expected to fill the

gap. Private sector participation in energy development in Lao PDR varies substantially, but could include everything from short-term basic management, contract and design, and build contracts, to far longer-term, concession-based design, build, finance, and operate contracts.

As noted earlier, the ability of the Lao government to invest in hydropower projects is limited. Thus, PPPs tap the private sector's administrative, operational and financing expertise to address such obstacle. The PPPs also bring in technical assistance and efficiency in project implementation (ADB, 2009a).

There are various PPP modalities available, including joint ventures, concessions, management contracts, as well as Build-Own-Operate (BOO), Build-Operate-Transfer (BOT), Build-Own-Operate-Transfer (BOOT), and Build-Own-Lease-Transfer (BOLT) schemes. These modalities are increasingly viewed as credible financing mechanisms for infrastructure assets, especially in energy and transportation.

Among the ASEAN countries, Thailand, Indonesia and the Philippines have seen mixed successes in the development and execution of projects under PPP arrangements. Also, based on its experiences with the private sector in the development of power facilities, Viet Nam has recently developed pilot legislations that allow PPPs between private and public sector entities (Das and James, 2013). Lao PDR can use the lessons learned from these countries' experiences when considering PPPs for its own hydropower development.

According to Queiroz, (2012), a PPP survey in Lao PDR revealed that there are 11 ongoing and 60 preparatory-stage hydropower projects in Lao PDR that can consider PPP arrangements. Two major hydropower plants regarded as PPPs are the Theun Hinboun Power Plant and Nam-Theun 2 Hydroelectric Project, both of which have significant financing support from ADB.

#### *1.4.2. ASEAN Infrastructure Funding*

The ASEAN cooperation in the energy sector has been guided by a series of Plans of Action—e.g., the ASEAN Plan of Action for Energy Cooperation (APAEC) 1999-2004, APAEC 2004-2009, and APAEC 2010-2015—which aims to pave the way for an enhanced regional energy security framework while promoting efficient utilisation and sharing of resources (ASEAN, 2010).

With US\$11 billion worth of completed or ongoing infrastructure projects supported by the ADB, the GMS countries (consisting of five ASEAN members Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam) plus Yunnan province of China implemented improvements in high-priority infrastructure projects—primarily in power, transport, and telecommunications sectors. While they had made big strides in interconnecting power systems, these nations' regional power infrastructure is still a long way off from effecting the advanced (or multi-country) power trading process envisioned under the GMS Inter-Governmental Agreement on Regional Power Trading because of insufficient financing (ASEAN, 2010). This is where AIF plays a crucial role in fulfilling the vision. It is another financing option for hydropower development projects, particularly in Lao PDR.

### **1.5. Other Financing Infrastructure Options**

The International Development Association (IDA) has been a financial partner of Lao PDR in the latter's various infrastructure development projects. Actual IDA commitments during 2005-2011, for example, amounted to US\$360 million for 27 operations, reflecting a marked improvement in IDA-country dialogue after the implementation of the Nam Theun 2 hydropower project in Lao PDR.

The core of IDA financial assistance to Lao PDR has been the poverty reduction support operations, which is in line with the policy agenda of the government's National Social-Economic Development Plans (NSEDPs). It provided additional aid amounting to about US\$86 million through 77 trust funds (TF) for such infrastructure areas as rural electrification and road maintenance (IEG, 2012).

Through IDA, other financial support partners such as AusAID, International Financial Corporation, Japan, and the European Union are potential sources of infrastructure financing. These financing partners had previously cooperated and coordinated effectively with IDA through multi-donor trust funds.

Other noteworthy partnerships with official and private sector partners were also forged during the implementation of the Nam Theun 2 hydropower projects in Lao PDR. In addition, as China and Viet Nam are rapidly becoming

important supporters of infrastructure development initiatives in Lao PDR, IDA has attempted to find modalities for coordinating with these two development partners (IEG, 2012).

Revenues from domestic industries can be another source of financing. For instance, revenues from the Nam Theun 2 projects as well as other hydropower and mining projects flow into the government's coffers and have begun to support eligible development programmes in rural electrification, rural roads, public health, and environmental protection through the Poverty Reduction Fund (PRF) project. The project targets the poorest districts and is based on a community-driven approach to providing development on social infrastructure in Lao PDR (IEG, 2012).

Asian Development Bank is a key financial support partner for infrastructure development in Lao PDR. In the hydropower sector in Lao PDR, ADB has provided funding to the Electricité du Lao PDR (EdL) through the public sector window, acted as the lead coordination agency for the government's negotiations with foreign investors, and provided legal and financial advice to Lao PDR. The Nam Theun 2 hydropower plant is an outstanding example of ADB's financial support for Lao PDR in various forms such as a public sector loan to the government, and a direct loan to the project company without government guarantee (ADB, 2009a).

Other ASEAN member countries as well as bilateral organisations such as the Japan Bank for International Cooperation (JBIC) can also help address gaps in financing the infrastructure development in Lao PDR. That is, if private sector funds prove inadequate, these bilateral organisations can mobilise long-term funds through capital markets or by co-financing, and stimulate market activities through the issuance of prime name credit papers and local currency bonds. They can help improve the flow of private savings and capital into infrastructure investments by developing bankable projects; designing appropriate, innovative financial instruments; assisting countries to enhance local technical capacity and knowledge; enhancing financial market depth, efficiency, liquidity, and adherence to international and regional standards or best practices; and promoting further financial integration in the ASEAN (Bhattacharyay, 2009).

## Conclusion

The state of infrastructure in Lao PDR is still poor compared with that of other ASEAN countries. Because of the inadequate government budget, most infrastructure projects are funded by foreign sources, which might lead to an accumulation of external debts. So as to promote investment in roads, the government has pre-investment mechanisms, but the costs of projects are high and resources are not allocated with efficiency in mind. This is why appropriate and effective ways to finance infrastructure, including the monitoring system, are crucial. In addition, increasing competition, transparency, and governance can make sure that the procurement becomes cost effective.

It is also important to sustain macroeconomic stability and confidence through improvement of fiscal and financial discipline, and development of a comprehensive guideline for FDIs. Finally, capacity building for government officers is necessary. Specific skills—not just engineering—are required so as to properly assess the costs (including the environmental and social costs) and benefits of projects.

## References

- Asian Development Bank [ADB] (2006), *Report of the Energy Efficiency Initiative*. Manila: ADB.
- Asian Development Bank [ADB] (2009a), ‘ADB Assistance for Public-Private Partnerships in Infrastructure Development - Potential for More Success’, *Special Evaluation Study*, No. SES:OTH2009-31. Manila: ADB Independent Evaluation Department.
- Asian Development Bank [ADB] (2009b), *Aid for Trade in Asia and the Pacific: An Update*. Manila: ADB.
- Asian Development Bank [ADB] (2009c), *Asian Development Outlook 2009*. Manila: ADB.
- Asian Development Bank [ADB] (2010a), Energy Sector in the Lao People's Democratic Republic. *Sector Assistance Program Evaluation*. No. SAP: LAO 2010-42. Manila: ADB Independent Evaluation Department.

- Asian Development Bank [ADB] (2010b), 'Sector Assistance Program Evaluation for the Transport Sector in the Lao People's Democratic Republic', *Evaluation Study*. No. SAP: LAO 2010-44. Manila: ADB Independent Evaluation Department.
- Asian Development Bank [ADB] (2012), 'Advancing Regional Cooperation and Integration in Asia and the Pacific', *Annual Report 2012*. Manila: ADB.
- Asian Development Bank [ADB] (2012b), *Key Indicators for Asia and the Pacific 2012*. Manila: ADB.
- Asian Development Bank Institute [ADBI] (2009), *Infrastructure for a Seamless Asia*. Tokyo: ADBI.
- Asian Development Bank Institute [ADBI] (2010), 'Trends in National and Regional Investors Financing Cross-border Infrastructure Projects in Asia', *ADBI Working Paper Series* No. 245. Manila: ADBI.
- Association of Southeast Asian Nations [ASEAN] (2010), *Master Plan on ASEAN Connectivity*. Jakarta: ASEAN.
- Association of Southeast Asian Nations [ASEAN] (2013), *Bridging the Development Gap among Members of ASEAN*. Jakarta: Initiatives for ASEAN Integration Unit.
- Australian Government (2012), *Lao People's Democratic Republic Annual Program Performance Report*. AusAID.
- Bertelsmann Stiftung's Transformation Index [BTI] (2012), *BTI 2012 - Laos Country Report*. Gütersloh: Bertelsmann Stiftung.
- Bhattacharyay, B.N. (2009), 'Infrastructure Development for ASEAN Economic Integration', *ADBI Working Paper Series*, No. 138. Manila: ADBI.
- Bhattacharyay, B.N. (2010), 'Estimating Demand for Infrastructure in Energy, Transport, Telecommunications, Water and Sanitation in Asia and the Pacific: 2010-2020', *ADBI Working Paper*, No. 248. Tokyo: Asian Development Bank Institute.
- Bounthongvongsaly, T., J. Susanto, M. Smits, K. Nanthavong, and L. Gaillard (2010), 'A Short Description of Pico Hydropower and Its Potential Role for off-grid Electricity in the Lao PDR', *Policy Brief on Pico Hydropower*. Vientiane: Lao Institute for Renewable Energy).
- Centennial Group Holdings (2009), 'Estimating Infrastructure Demand for Asia and the Pacific 2010-2020', *ADBI Commissioned Report*. Tokyo: ADBI.

- Chheang, V. and Y. Wong (2012), *Cambodia-Laos-: Economic Reform and Regional Integration*. Phnom Penh: Cambodian Institute for Cooperation and Peace.
- Das, S.B. and C.R. James (2013), *Addressing Infrastructure Financing in Asia*. Singapore: Institute of Southeast Asian Studies.
- Delang, C.O. and M. Toro (2011), 'Hydropower-induced Displacement and Resettlement in the Lao PDR', *South East Asia Research* 19(3), pp. 567–594.
- Electricité du Laos [EDL] (2010), *Annual Report 2010*. Vientiane: EDL.
- Electricité du Laos [EDL] (2012), *EDL's Power Purchase Policy*. Vientiane: EDL.
- Energy Studies Institute [ESI] (2012), 'Energy Trends and Development', *ESI Bulletin* 5(3). International Centre for Environmental Management [ICEM] (2010), *MRC Strategic Environmental Assessment (SEA) of Hydropower on the Mekong Mainstream*. Hanoi, Viet Nam, ICEM Australia: 198.
- International Energy Agency [IEA] (2012), *World Energy Outlook 2012*. Paris: IEA.
- Independent Evaluation Group [IEG] (2012), 'Country Assistance Strategy Completion Report: Lao PDR', *Completion Report*. Washington D. C: World Bank.
- International Finance Corporation [IFC] (2012), 'IFC Promotes Sustainability of the Hydropower Sector in Lao PDR', *East Asia and the Pacific*. Washington, D.C: IFC.
- International Fund for Agricultural Development [IFAD] (2011), 'Lao People's Democratic Republic Oudomxai Community Initiatives Support Project', *Evaluation Report*, No. 2415-LA. Rome, Italy.
- International Monetary Fund [IMF] (2011), *Annual Report of the Executive Board for the Financial Year Ended April 30, 2011: Pursuing Equitable and Balanced Growth*. Washington D.C.: IMF.
- Investment Promotion Department [IPD] (2010), *Investment Calling List Guide (Special Edition)*. Vientiane: IPD.
- Kyophilavong, P. (2010), "Lao People's Democratic Republic: Dealing with Multi 17 Currencies" in Capannelli, G and Menon, J (eds.), *Dealing with Multiple Currencies in Transitional Economies*. ADB.
- Kyophilavong and Toyoda (2008), *Impact of Foreign Capital Inflows on the Lao PDR Economy*, in Toyoda (Ed.) *Empirical Research on Trade and Finance in East Asia*. Research Series. Hiroshima Shudo University.

- Liyong, S. (2012), 'Laos: The Hydroelectric Battery of Southeast Asia', *ESI Bulletin*, 5(3).
- Lord, M. (2009), 'East-West Economic Corridor (EWEC) Strategy and Action Plan', *MPRA Paper*, No.41147. Manila: ADB.
- Malaiwan, T. and Y. Peerapornpisal (2009), 'Diversity of Phytoplankton and Water Quality in the Reservoir of Nam Ngum Dam. Lao PDR', *KKU Science Journal* 37, pp. 42 - 49.
- Mekong River Commission [MRC] (2008), Regional Multi-Stakeholder Consultation on the MRC Hydropower Program. *Consultation Proceedings*, 25-27 September. Vientiane, Lao PDR.
- Melhuish, C.M. (2010), 'Lao PDR Road Maintenance Project 2', *Independent Completion Report*. Canberra: Australian Agency for International Development.
- Milattanapheng, C. (2012), 'Regional Workshop on GMS Country Experiences in Achieving Performance Targets'. Country Presentation, Lao PDR, 8-10 August, Chiang Mai Thailand.
- Ministry of Energy [MOE] (2011), *Thailand: 20-Year Energy Efficiency Development Plan (2011 - 2030)*. Bangkok: MOE.
- Ministry of Energy and Mine [MEM] (2011), *Renewable Energy Development Strategy in Lao PDR*. Vientiane: MEM.
- Ministry of Natural Resources and Environment [MONRE] (2012), *Lao Environment Outlook*. Vientiane: MONRE.
- Ministry of Planning and Investment [MPI] (2010), *7<sup>th</sup> National Socio-Economic Development Plan (2011-2015)*. Vientiane, Lao PDR.
- Ministry of Planning and Investment [MPI] (2011), *Lao PDR FDI Policy*. Vientiane: Investment Promotion Department.
- Ministry of Public Works and Transport [MPWT] (2013), *Road Network Development Plan 2011-2020 and Medium Action Plan 2011-2015*. Vientiane: MPWT.
- National Assembly (2009), *Law on Investment Promotion*. Vientiane: National Assembly.
- Oraboune, S. (2008), 'Infrastructure Development in Lao PDR', in Kumar, N. (ed.) *International Infrastructure Development in East Asia – Towards Balanced Regional Development and Integration*. ERIA Research Project Report 2007-2. Chiba: IDE-JETRO, pp.166-203.
- Pereraand, R. and A.S. Permana (2009), 'Developing Eco-efficient and Sustainable Urban Infrastructure in Asia and Latin America'. Expert Group Meeting, 10-12 February. Bangkok, Thailand.

- Phomsoupha, X. (2009), 'Hydropower Development Plans and Progress in Lao PDR', *Hydro Nepal* 4, pp.15–17.
- PricewaterhouseCoopers [PwC] (2011), 'Providing Insights to the Challenges Facing Asian Infrastructure'. Report from a survey. Singapore: PwC.
- Queiroz, C. (2012), 'Project Pipeline Screening and Initial Feasibility Assessment of Potential Road Infrastructure PPPs in Lao PDR'. Draft Final Report. Washington D.C: World Bank.
- Rhee, C. (2013), 'Challenges for ADB in Investment Financing', Presentation Paper. *Investment and Investment Finance: The Supply and Demand of Long-term Finance*. Moscow, 13-14 February 2013.
- Thoummavongsa, S. and X. Bounsou (2013), 'Sustainable Management of Hydropower in Lao PDR', *GMSARN International Journal* 7(1).
- Watcharejyothin, M. and R. M. Shrestha (2009), 'Effects of Cross-border Power Trade between Laos and Thailand', *Energy Policy* 37(5), pp. 1782-1792.
- World Bank (2008), *Lao PDR Economic Monitor*. Vientiane: World Bank Office.
- World Bank (2010), *Lao PDR, Investment and Access to Land and Natural Resources: Challenges in Promoting Sustainable Development*. Vientiane: World Bank.
- World Bank (2011), *Lao PDR Investment Climate Assessment, Policies to Promote Growth in the Non-Resource Sectors*. Poverty Reduction and Economic Management Sector Department, East Asia and Pacific Region.
- World Bank (2012), 'Tightening Demand to Maintain Macroeconomic Balance', *Lao PDR Economic Monitor*. Vientiane: The World Bank Lao PDR Country Office.

