

Infrastructure scoping study summary: Laos

1. Introduction

While the Laos economy has recently experienced rapid growth, with poverty falling substantially, there is significant room for improvement in the country's current state of infrastructure quality, particularly in transport, power, and water & sanitation. This summary will cover these sectors as well as a more general macroeconomic and infrastructure overview.

The views and opinions expressed in this document are those of the authors and do not necessarily reflect the official policy or position of any department of the UK Government.

2. Infrastructure overview

2.1 Macroeconomic overview

Growth is among the fastest in Southeast Asia, averaging 7.7% per annum over the past decade up to 2017. GDP per capita is expected to reach USD 2,577 in 2018, and has the potential to further rise to the levels of Indonesia and Thailand.

Despite being a small, landlocked country, Laos's mountainous terrain and location between China and SE Asia presents it with significant infrastructure development potential. Growth has been driven by its power (mainly hydropower), construction, and mining sectors, which have attracted the majority of the large net FDI inflow. (Figure 2) This represents initiatives from the Laos government to work with international investors to develop its economic infrastructure; almost 73% of infrastructure project roles are undertaken by an international entity. However, about 73% of Laotians work in the agriculture sector, meaning economic benefits of FDI are not spread particularly evenly across the population.

Manufacturing and tourism are expected to be key drivers of infrastructure construction projects going forward, especially in the fields of transport and power-network integration.

2.2 Constraints and opportunities

Some of the key limiting factors to sustained infrastructure development in Laos are:

- **Financial;** the government lacks fiscal capacity, SMEs face multiple financing challenges, frequent external financing means local financial industry misses out on growth opportunities.
- **Technical;** not enough capacity in construction industry to meet high demand for construction of infrastructure assets, few experienced domestic firms, dependence on foreign firms in equipment and other supplies, underdeveloped transport infrastructure increase logistics costs.
- **Labour;** large unskilled population, so developers need to provide their own workers.

Figure 1: GDP growth rates in select ASEAN countries. Source: World Bank Data

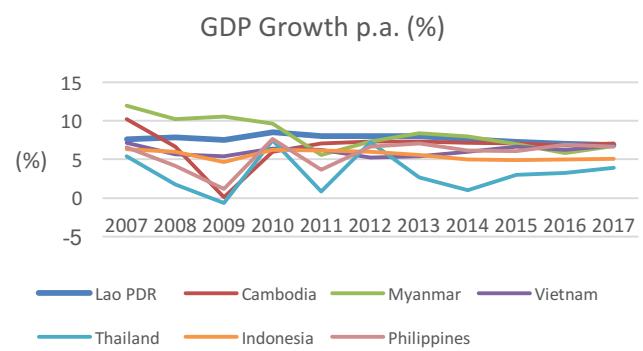
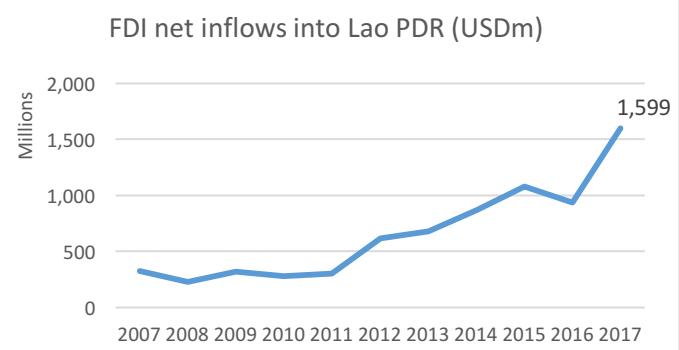


Figure 2: FDI net inflows into Laos. Source: World Bank Data



- **Regulatory;** weak legal and contracting environments, government reluctant to implement legal reforms, corruption, opposition from villagers who get displaced from their homes.
- **Political;** risks of violence from clashes between Hmong fighters and government, low ranking in risk/reward index from BMI Research (18 out of 21).¹

Further, there are opportunities to promote more inclusive growth in the following areas:

- **Job Creation and Wage Equality;** Poor rural households not experiencing the income gains that urban households are thus exacerbating inequality, significant gender wage gap (women earn USD 59 less a month).
- **Health and Nutrition;** insufficient access to healthcare services and education, malnutrition stunting over 30% of children under 5, lack of family planning contributing to high fertility rate, high rates of teenage pregnancy, improvements needed in health facility access in rural areas.
- **Human Capital;** low educational attainment – 67% of labour force having up to only lower secondary education; better skilled labour can transition out of agriculture.
- **Fiscal Sustainability;** while the fiscal deficit has reduced to 4.7% of GDP in 2018 and revenue administration has improved, debt-to-GDP expected to still rise and the risk of Laos facing an external debt distress has been raised from moderate to high by the IMF in 2017.
- **Investment in Infrastructure;** surging support from Chinese companies and lenders as well as utility companies from Thailand and Vietnam.

3. Sectoral Analysis

3.1 Transport

Laos is a mandatory transit location for roads and railways connecting China, Thailand, and Vietnam; hence development of major cross-country transport infrastructure is expected to be a focus under China's 'Belt and Road Initiative'. The Association of Southeast Asian Nations (ASEAN) also proposed the Pan-Asian railway network in 2000, which has been driven by China-led railway projects; this offers potential for Laos to modernise its transport network and enhance connectivity. Transport is an area of focus with multiple sources of lending and technical construction support, presenting many opportunities for future projects.

Roads

In the capital, Vientiane, roads have not been able to keep up with growing numbers of vehicles, and less than 1% of journeys were taken using public transport. As such there is increased congestion and high incidence of road traffic accidents as well as worsening air quality from pollutant emissions.

Of 51,600km of roads, the highest share is rural roads (46%) and the most developed type, national roads, take up only 14% of total road length. Only 78% of the national road length is paved. Of the local roads (Provincial, District, and Rural roads), only 9% of their length is paved, with 50% in good or fair condition; these underdeveloped roads take up a majority 74% of the total road length in Laos.

Pipeline and completed projects:

- **Vientiane Sustainable Urban Transport Project:** USD 100 million, for 11km of dedicated bus lanes and 24 bus stations. Funded by ADB, EIB, expecting construction to be finished in 2021.ⁱ
- **Vientiane Expressway:** USD 200 million, 15km of roads, sponsored by Nolico Company (China); Asia Investment, Development and Construction Sole Co Ltd (AIDC, Laos), expected construction end in 2021.ⁱⁱ
- **Vientiane – Vangvieng Expressway:** Value of USD 1,300 million, for 113.5km of roads and bridges, expected to be a segment of the Vientiane-Boten Expressway, sponsored by Government of Laos and Yunnan Construction and Investment Holding Group.ⁱⁱⁱ

Railway

ⁱ Asia Investment Opportunities in Infrastructure: Risk/Reward Analysis, 2018, BMI Research, <https://www.fitchsolutions.com/sites/default/files/2018-07/asia-infrastructure-may2018.pdf>

Currently, the railway network in Laos is highly underdeveloped; the completion of pipeline projects can bring significant urban development opportunities in smaller cities along the transport network, facilitating shared prosperity across the country.

Pipeline and completed projects:

- **China-Laos Railway:** Value of USD 7,200 million, with a 414km length of railway running from China's provincial capital of Kunming to Vientiane. Sponsored by Government of China and Laos, expected construction end in 2021.
- **Savannakhet – Lao Bao Rail Link Project:** Value of USD 4,000 million, building 220km of rail, an electrified rail project that would cover Laos from east to west; beyond it is planned to cross Vietnam. Sponsored by Laos Ministry of Public Works and Transport (MPWT) and operated by Malaysia Giant Consolidated Group.

Airports

There are four international airports in Laos; upgrades and construction of new airports are driven by goals to boost the tourism sector. MPWT have proposed plans to expand the existing international airports, develop another, and renovate six domestic airports.

Pipeline and completed projects:

- **Wattay International Airport Expansion Project:** USD 61 million, completed in mid-2018, sponsored by the Laos Government with lending from Japan International Cooperation Agency (JICA).
- **Nong Khang International Airport:** USD 74 million; new international airport with planned capacity of 100,000 million passengers / year. Currently under construction, sponsored by Hoang Anh Gia Lai Joint Stock Company and the Government of Laos.

3.2 Power

Hydropower

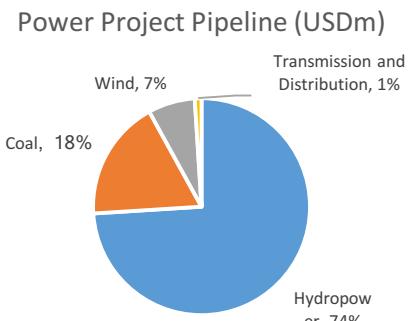
Laos' geography and terrain grant it huge potential for hydropower development. Indeed hydropower accounted for 52 of 59 major power projects under construction in Laos as of March 2019, with an investment value of more than USD 23.1 billion. As shown in Figure 3, this represents 74% of the total value of Laos' power project pipeline. Laos exports significant amounts of power to neighbouring countries including Thailand, Vietnam, and Cambodia.

However, due to potential environmental damage to fish resources, land erosion and water flow alteration in Vietnam and Cambodia from the building of hydroelectric dams on the Mekong River, political risks exist for Laos' largest hydropower projects. Environmental concerns should be adequately addressed before Laos can achieve any long term plan to be a major regional power exporter.

Pipeline and Completed Projects:

- **Ban Khoum Hydropower Plant, Champassak;** 1,872MW plant, with a value of USD 4,400 million, still in planning stage, operated by Italian Thai Development.
- **Xayaburi Hydropower Plant, Xaignabouli;** 1,285MW plant, with a value of USD 3,500 million, with construction completed in 2018. Multiple energy / construction company sponsors and funding from several banks.
- **Pak Beng Hydropower Plant, Oudomxay;** 912MW plant, with a value of USD 2,400 million, currently in planning. Sponsored by Chinese / Thai companies and the Government of Laos.
- **Pak Lay Hydropower Plant, Xaignabouli;** 1,320MW plant, with a value of USD 2,400 million, in planning stage, supported by Exim Bank of China, operated by China National Electric Import & Export Corporation / Sinohydro Corporation
- **Luang Prabang Hydropower Plant, Luang Prabang;** 1,410MW plant, with value of USD 1,700 million, with feasibility studies / environmental impact assessment ongoing, operated by PetroVietnam Power Corporation.

Figure 3: Laos Power Projects Pipeline



Source: BMI Research

Transmission and distribution

Currently, 90% of households in Laos are connected to electricity; expansion of networks in rural areas is key to reaching the final 10%. While energy supply has increased, but lack of progress in transmission infrastructure has affected its ability to efficiently utilise generation capacity.

Transmission and distribution projects account for only 1% of the total value of power projects in the pipeline. But through China's BRI there are numerous power network integration plans among countries in the Mekong region, and there has been a gradual rise in investment and construction of transmission and distribution infrastructure, including new transmission grid lines to Vietnam and upgrading of existing lines to Thailand.

China Southern Power Grid Co. also signed a Memorandum of Understanding (MOU) in August 2018 with the Laos Government to execute a feasibility study on the possibilities of developing a nation-wide power grid, with a view to this company constructing the proposed grid.

3.3 Water and sanitation

Water

Laos is well equipped with water resources, with hundreds of rivers and waterways within the country and 90% of its land area located within the Mekong river basin. However, although 78% of households have access to basic drinking water, 83% of them are from water sources which have been contaminated by the harmful E. Coli bacteria.

Regulations for water management are weak and lacking; the ongoing Mekong Integrated Water Resources Management (MIWRM) programme supported by the World Bank seeks to develop rules-based environment for water usage. In Jul 2017, the WB executed an agreement with the Government of Laos to provide additional funding of USD 25 million for the MIWRM programme. Currently this programme is operating in the following areas^{xxiv}:

- **Water Supply and Sanitation Management;** support the government to increase public awareness and community ownership on the implementation of rural water supply systems, as well as rural and urban sanitation projects.
- **Irrigation Management;** considerable investments made by the government towards construction of irrigation systems to enhance agricultural production.
- **Flood and Stormwater Management;** many cities are susceptible to flooding; MIWRM helped construct flood protection levees, pumping stations, and stormwater drains, as well as installation of flood warning and emergency management systems.
- **Water Pollution Management;** Capacity building plan implemented for the monitoring, rehabilitation, and management of water quality. Also a pilot project which monitors the water quality in river basins has been executed.

Sanitation

Poor sanitation has been one of the leading causes of child stunting in Laos. Open defecation is extremely common, only 60% of primary schools have water supply and toilet facilities, and 60% of households in remote rural villages also do not have toilets.

Community-Led Total Sanitation (CLTS) is a methodology for mobilising communities to completely eliminate open defecation through encouraging behaviour change, and has proved to be effective in generating greater ownership and sustainability among the local communities. Coupled with sanitation marketing efforts in 266 villages, the proportion of villagers having access to sanitation facilities increased from 38% in July 2014 to 64% in February 2016. In urban areas this increase has been even faster.

In Vientiane specifically 98% of households use improved sanitation facilities, but the city does not have a sewage system, such that there are issues of groundwater contamination which directly impacts the community's health and livelihood.

To improve wastewater management, the option of a USD 120 million Environmental Sanitation and Resilience Project has been raised, which would develop a wastewater treatment plant and drainage. In addition, the government of Hungary has offered USD 100 million financing to develop a water treatment plant in the city which will filter sewage from households and factories, before piping it to waterways. There is, however, greater need for continued sanitation projects especially in rural areas.

4. Activities of multilaterals and donors

Various multilateral institutions and other donors undertake activities in Laos, mostly conducted through the provision of loans, grants, and technical assistance programmes. A brief summary of who operates in Laos and their sector focuses is below.

1. **World Bank**
 - **Transport;** road maintenance
 - **Power;** reliability of distribution
 - **Water and Sanitation;** access to better water supply / sanitation services
 - **Agricultural;** improving competitiveness of selected agricultural value chains
 - **Human Capital;** improve quality of early childhood education
 - **Health and Nutrition;** coverage of reproductive, maternal, and child healthcare services
 - **Environment;** strengthen environment protection management systems
 - **Governance/Finance;** provide long term funding access to SMEs / enhance public finance management capabilities
 - **Disaster Management/Others;** Assistance to mitigate impact of flooding
2. **International Finance Corporation (IFC)**
 - **Power;** April 2019 MOU with Laos government to attract private investments in power transmission infrastructure
 - **Environment;** Improve environmental standards in hydropower sector. Support forestry business models that are beneficial to local communities
 - **Governance/Finance;** Enhance local banks' lending capacity for SMEs. Improve FS infrastructure such as credit reporting and payment systems. Improve and simplify business regulations.
3. **Asian Development Bank (ADB)**
 - **Transport;** enhance connectivity in towns along GMS central corridor
 - **Water and Sanitation;** expand coverage of an existing project
 - **Agriculture;** improve irrigation and rural infrastructure
 - **Health and Nutrition;** expand healthcare coverage and improve quality
 - **Environment and Conservation;** Improve urban environmental services in towns along the GMS central corridor
4. **Asian Infrastructure Investment Bank (AIIB)**
 - **Transport;** April 2019 approved loan for road maintenance project
5. **Japan International Cooperation Agency (JICA)**
 - **Transport;** develop infrastructure and networks
 - **Power;** develop more reliable power generation and transmission infrastructure
6. **KfW Development Bank**
 - **Transport;** finance construction/repair of roads, tracks and bridges in rural areas
 - **Human Capital;** support teacher training, expand vocational training centres
 - **Environment;** support protection of forests and biodiversity
 - **Governance/Finance;** financing to local banks to enhance lending to SMEs and poor households
 - **Disaster Management/Others;** financing for dam reconstruction after collapse in July 2018
7. **European Investment Bank (EIB)**
 - **Transport;** financing for paving and stabilising of roads, finance for Bus Rapid Transit system
 - **Power;** financing for hydropower project
8. **Korea International Cooperation Agency**
 - **Transport;** finance study on railway link between Laos and Vietnam
 - **Power;** financing for Xe Pian Xe Nam Noy hydropower plant in 2015
 - **Water and Sanitation;** financing for master plan for water resource management in Nam Ngum River Basin. Water management for Mekong.
 - **Health and Nutrition;** financing for hospital construction projects in 2016 and 2017
9. **Government of Hungary**
 - **Water and Sanitation;** support development of municipal waste treatment plant in Vientiane
 - **Agriculture;** improve agricultural land management, enhance food security
 - **Human Capital;** annual scholarships to Laotian students for university study in Hungary

10. USAID

- **Health and Nutrition;** help in disease response, promote nutrition, hygiene and child health
- **Environment;** improve forest management practices, assist in climate change resilience in communities
- **Governance/Finance;** help improve trade and investment related laws and regulations

References:

- i. ADB official website, <https://www.adb.org/projects/45041-002/main>
- ii. “Concession agreement signed for Vientiane Expressway Number 1 Project”, 6 Mar 2019, Asia News Network, Vientiane Times, <http://annx.asianews.network/content/concession-agreement-signed-vientiane-expressway-number-1-project-92651>
- iii. “Lao govt, Chinese firm ink pact for 1st expressway in Laos”, 5 Apr 2018, XinhuaNet, http://www.xinhuanet.com/english/2018-04/05/c_137088851.htm
- iv. ASEAN IWRM official website, <https://aseaniwrm.water.gov.my/iwrm-in-laos/>

Infrastructure and Cities for Economic Development (“ICED”) is a project funded by the UK’s Department for International Development (“DFID”) and is led and administered by PricewaterhouseCoopers LLP, working with organisations including Adam Smith International, Arup, Engineers Against Poverty, International Institute for Environment and Development, MDY Legal and Social Development Direct.

This document has been prepared only for DFID in accordance with the terms agreed with DFID and for no other purpose. PricewaterhouseCoopers LLP and the other entities delivering ICED (as listed above) accept no liability to anyone else in connection with this document.