

## ECONOMIC ANALYSIS

1. **Macroeconomic context.** The Lao People's Democratic Republic (Lao PDR) is a small, landlocked country that has achieved high levels of economic growth since 2009, generally 7%–8% annually. However, this growth has been highly concentrated in just a few sectors and closely linked to the development of hydropower and mining. Foreign direct investment in other sectors has been constrained by the perception that the country's investment and regulatory environment is unpredictable and risky. The benefits of this natural resource boom have yet to spread to other sectors and the wider population. The challenge is to ensure that development is broad-based, equitable and sustainable, and that the national economy diversifies its sources of growth.

2. **Sector context.** Tourism has proven to be a resilient industry, recovering quickly from crises and growing fast worldwide, particularly in Asia. In Lao PDR international tourist arrivals reached 3.3 million in 2012, a 22% increase from 2011. The travel and tourism industry contributes 5.3% to gross domestic product, sustains 134,000 jobs (4.5% of total employment),<sup>1</sup> and generates \$0.51 billion in annual receipts. Tourism has the potential to develop further and counterbalance the country's overreliance on natural resources, provide opportunities to increase foreign exchange earnings, support inclusive economic growth, and create new jobs, especially for the poor and women.

3. About 92% of inbound tourists originate in Southeast and East Asia, with Thailand (58%), Viet Nam (21%), and the People's Republic of China (6%) important source markets. There are 2,030 accommodation establishments with 35,857 bedrooms, of which less than 10% are rated 5-star. Between 2006 and 2012 the number of bedrooms increased by 96%, but there are about four times as many lower-priced guesthouses (1,562) as hotels (486). Occupancy rates are highest in Luangprabang at 70% but typically hover around 50% in the rest of the country. The main international airports in Vientiane, Luangprabang, and Champasak are served by eight airlines and receive about 10,500 flights per year, with 1.31 million scheduled inbound seats. While the country has many cultural and natural attractions with good development potential, tourism activity remains highly concentrated in Vientiane Capital, which accounts for 43% of international arrivals and 47% of hospitality investment. Critical constraints to more inclusive and geographically dispersed growth are insufficient last-mile transport infrastructure in secondary destinations, weak market linkages between the tourism supply chain and other economic sectors, and low service standards. Consequently, average receipts per visitor are \$154, the lowest in the Greater Mekong Subregion (GMS), and much less than the benchmark \$1,390 in Asia and the Pacific.

4. **Economic rationale for government intervention.** Tourism development depends on supporting public infrastructure to provide access to destinations and maintain tourist sites in good condition. Some of the investments required in project areas such as access roads, river piers, or waste management facilities are too large for individual tourism investors. These facilities are pure public goods with both a low degree of excludability and subtractability.<sup>2</sup> The market failure to produce these goods justifies public intervention. Moreover, proposed infrastructure is not solely to support tourism. It will be used by the local population to transport agricultural products from farms to markets more efficiently and to access education and health services. Developing these facilities will also help catalyze additional private investment in

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<sup>1</sup> World Travel and Tourism Council. 2013. *Travel and Tourism Economic Impact 2013: Laos*. London.

<sup>2</sup> Excludability is the degree to which a potential user of a good or service can be excluded from using it. Subtractability refers to how much one user's consumption of a good or service subtracts from the ability of others to consume without raising production costs.

tourism superstructure and local enterprises such retail services, food and craft production, and cultural and recreation services, which would not occur without this infrastructure in place.<sup>3</sup> The government is in the best position to address these market failures.

5. **Economic analysis of subprojects.** The economic analysis of infrastructure subprojects was undertaken based on preliminary designs and cost estimates, including the cost of capacity-building activities and interest on the Asian Development Bank (ADB) loan. The methodology adopted for the economic evaluation follows ADBs *Guidelines for the Economic Analysis of Projects*,<sup>4</sup> ADB guidelines for economic analysis of tourism projects,<sup>5</sup> and the approach of other ADB-financed tourism projects.<sup>6</sup> The economic analysis compared the costs and benefits in with- and without-project scenarios over a period of 30 years from 2014 to 2043. The economic viability of the subprojects was assessed by computing the economic internal rate of return (EIRR) and net present value from a stream of incremental benefits and costs attributable to the investments. Using the domestic price numeraire, the economic costs were derived from financial cost estimates and segregated into tradeable and non-tradeable components. Based on conversion factors taken from recent ADB studies in the Lao PDR, the financial costs were converted to economic costs using a shadow exchange rate factor of 1.1 and a shadow wage rate factor for unskilled labor of 0.75.<sup>7</sup> All costs and benefits are expressed in constant 2013 prices. Incremental operation and maintenance (O&M) costs have been added to capital costs to obtain the total economic cost of the subprojects for each year. Alternative designs were assessed for each subproject and the least-cost alternatives were selected.

6. Economic benefits identified for each subproject were subject to sensitivity analysis to test their robustness under various changed assumptions. The sensitivity scenarios assumed (i) a 10% decrease in the expected number of foreign and domestic tourists, which may arise from inadequate destination marketing or poor O&M practices; (ii) a 10% decrease in foreign tourist spending; (iii) a 10% increase in the investment cost; and (iv) a 1-year delay in project implementation due to slower-than-expected consultant recruitment and procurement. The economic benefits that were identified and quantified include: (i) tourism benefits, (ii) vehicle operating costs (VOC) savings, and (iii) agriculture benefits for the Chom Ong Cave access road improvement subproject.

7. **Tourism benefits.** Project investments in access infrastructure, improved environmental services, capacity building, and destination marketing within and around the tourism sites will induce an incremental influx of foreign and domestic tourists and encourage them to stay longer. With-project assumptions for incremental annual increases in tourist arrivals are 1% to 21%, while the length of stay is expected to increase by 0.4 to 1.1 days. This will generate more revenues from increased tourist spending and create tourism-related jobs. The tourism benefits gained by the subprojects are the increased net expenditure of tourists. To compute the net expenditure of tourists, the analysis conservatively applies an income multiplier of 0.30 to incremental tourist spending to account for economic leakage. Taking potential substitution effects into consideration, the analysis then assumes only 50% of the net tourist expenditure is the project-induced benefit arising directly from the subprojects. Conservative assumptions for

<sup>3</sup> Tourism superstructure comprises facilities developed specifically in response to visitor demands.

<sup>4</sup> ADB. 1997. *Guidelines for the Economic Analysis of Projects*. Manila

<sup>5</sup> ADB. 2007. *ERD Technical Note Series No. 20: Tourism for Pro-Poor and Sustainable Growth: Economic Analysis of Tourism Projects*. Manila

<sup>6</sup> ADB. 2002. *Report and Recommendation of the President to the Board of Directors: Proposed Loans to the Kingdom of Cambodia, Lao People's Democratic Republic and Socialist Republic of Viet Nam: GMS Mekong Tourism Development Project*. Manila.

<sup>7</sup> ADB. 2012. *Report and Recommendations of the President to the Board of Directors on a Proposed Loan to the Lao People's Democratic Republic: GMS East-West Economic Corridor Towns Development Project*. Manila.

the number of tourist arrivals, average stay and spending, and projections under with- and without-project scenarios were estimated by subproject, taking into account historic trends, attractiveness of the subproject area, constraints on tourism development in the area, and the impact of the project on removing and/or releasing the constraints. Demand forecasts consider official statistics, visitor surveys undertaken during project preparation, and consultations with tourism industry stakeholders.<sup>8</sup>

8. **Vehicle operating cost savings.** The roads leading to tourist sites included in the project are either clay or gravel and in very poor condition. Some of them are impassable during the rainy season. Traveling on the roads is dusty and uncomfortable and makes it difficult for tourists to access the attractions. The VOC savings attributable to the project arise from an improvement of road condition measured by roughness, based on the international roughness index (IRI).<sup>9</sup> Reduced road distance has not been considered in the analysis because all subprojects will upgrade existing alignments. The annual projections for vehicle traffic in the with- and without-project scenarios were calculated based on recent growth in the number of registered vehicles, assumptions for future vehicle ownership, and observed baseline traffic. The average one-way trip distance used to calculate the vehicle operating cost savings was assumed to be 50% of project road lengths, with each vehicle making one round-trip per day.

9. **Income from agricultural production.** In Oudomxay the local population mainly plants maize and legumes for export to the People's Republic of China (PRC) and rice for personal consumption. The upgrading of the access road to the Chom Ong Cave will be a catalyst to increase the amount of cultivated land in the road's catchment area. Although there is about 30,000 hectares of vacant arable land available, the cultivated area is currently limited because it is difficult to move crops from farm to market due to the poor condition of the road. Increasing the cultivated area to plant more maize will result in additional surplus production. This surplus will generate additional income for local residents. The total increase in cultivated area over a 25 year period (2018–2043) is conservatively assumed to be 7,672 hectares, or about 24% of the available land in the road catchment. In comparison, the province-wide area under maize cultivation increased by 5,245 hectares during 2005–2011. Maize exports to the PRC increased fourfold during the same period.<sup>10</sup>

#### A. **Output 1: Last-Mile Tourism Access Infrastructure Improved.**

10. **Xang Cave access improvements.** The economic benefits identified and quantified for this subproject are tourism benefits and VOC savings. Xang cave recorded only 5,000 visitors in 2012 due to poor access and a lack of facilities and services. Improving the 4 kilometer (km) access road and public amenities at the cave together with better marketing will result in increased tourist arrivals and longer stays in Khammouane. This will generate more revenues from tourist spending. In the without-project scenario, the length of stay is assumed to remain at the current level: 3 days for foreign tourists and 1 day for domestic tourists. Tourist spending is also assumed to remain at current levels: \$47 per day for foreign tourists and \$16 per day for domestic tourists. In the with-project scenario, the length of stay of both foreign and domestic tourists is expected to increase by 1.1 days, to 4.1 days for foreign tourists and to 2.1 days for domestic tourists. Average daily spending in the with-project scenario is assumed to remain at the existing levels. Improvement of the 4 km access road will generate VOC savings from the

<sup>8</sup> Tourism Demand Analysis (available from the list of linked documents in Appendix 2).

<sup>9</sup> The IRI is the roughness index obtained from measured longitudinal road profiles. Since its introduction in 1986, IRI has become the road roughness index most commonly used worldwide for evaluating and managing road systems.

<sup>10</sup> P. Onphanhdala and T. Suruga. 2013. *Chinese Outward FDI in Agriculture and Rural Development: Evidence from Northern Laos*. Kobe University.

improved road surface condition (IRI 14 to 4). Assumptions for vehicle ownership are as follows: 70% of the households in the two villages living along the road own a motorcycle, 10% own 3-wheeled vehicles, and 10% own light trucks (1.5–2.5 tons). The base case EIRR is 13.2%. The sensitivity analysis shows that the project remains economically viable for all adverse variations, with EIRRs ranging from 12.2% to 13.1%.

11. **Chompet Heritage District access improvement.** The economic benefits identified and quantified for this subproject are tourism benefits. Chomphet Heritage District is located on the western bank of the Mekong River directly opposite Luangprabang town and is part of the United Nations Educational, Scientific and Cultural Organization World Heritage Site. The district ferry terminal and jetty are in very poor condition, which discourages tourists from visiting the area. Improving the jetty and ferry terminal together with marketing and service improvements will increase the number of tourists that visit Chomphet and lengthen their stay in Luangprabang. In the without-project scenario the average length of stay of foreign tourists is assumed to remain unchanged at 5 days, and average daily spending is assumed to remain about \$75. For domestic tourists in the without-project scenario, the length of stay is assumed to remain at 3.5 days with average spending of \$40 per day. In the with-project scenario it is assumed that the length of stay of foreign tourists will increase to 5.5 days and the length of stay of domestic tourists will increase to 4 days. It is assumed that international and domestic tourist spending will remain the same as in the without project scenario. The base case EIRR is 14.1%. The sensitivity analysis shows that the subproject remains economically viable for all adverse variations, with EIRRs of 12.5% to 14.0%.

12. **Ban Xang Hai–Tham Ting Caves access improvements.** The economic benefits identified and quantified for this subproject are tourism benefits. The subproject will upgrade river, road, and footpath access to historic Tham Ting caves, set in a grotto above the Mekong River. The village of Xang Hai, with beverage-making demonstrations, and Pak Ou, with weaving and river excursions, will be visited by more tourists because they are located along the project road and ferry route to Tham Ting caves. In the without-project scenario the length of stay is assumed to remain unchanged at 5 days for foreign tourists and 3.5 days for domestic tourists. Average daily spending is also assumed to stay the same, with foreign tourists spending on average \$75 per day while domestic tourists spend about \$40 per day. In the with-project scenario foreign tourists are assumed to increase their stay to 5.5 days and domestic tourists are assumed to increase their stay to 4 days. International and domestic tourist average daily spending is assumed to remain at current levels. The base case EIRR is 37.8%. The sensitivity analysis shows that the subproject remains economically viable for all adverse variations, with EIRRs of 20.6% to 35.6%.

13. **Chom Ong Cave access improvements** The economic benefits identified and quantified for this subproject are tourism benefits, VOC savings, and increased income from agricultural production. The Chom Ong Cave is accessed from Oudomxay Town via a 54 km rural road that is in very poor condition and inaccessible during the rainy season. The subproject will upgrade the road to allow all-weather access. Foreign tourists currently stay in Oudomxay for an average of about 1.5 days and spend about \$37 per day. Domestic tourists also stay about 1.5 days and spend about \$20 per day on average. These figures are assumed to remain unchanged in the without-project scenario, while in the with-project scenario, the length of stay is expected to increase by 1 day to 2.5 days for both foreign and domestic tourists. Average daily spending of international and domestic tourists is assumed to remain the same as in the without-project scenario. Improvements to the 54 km access road will generate VOC savings from the improved road surface condition (IRI 14 to IRI 4). The annual projections for vehicle traffic in the with- and without-project scenarios were calculated based on observed traffic and

assumptions for vehicle ownership, with 20% of the households in the road influence area owning a motorcycle, 5% owning 3-wheeled farm vehicles, and 1% with light trucks. Further, it is assumed that about 50% of the corn produced will be hauled to market by medium-sized trucks with a load capacity of 2.5 tons, and the remaining 50% by light cargo trucks with capacity of 1.5 tons. The base case EIRR is 13.0%. The sensitivity analysis shows that the subproject remains economically viable for all adverse variations, with EIRRs ranging from 12.1% to 12.9%.

## B. Output 2: Environmental Services in Cross Border Tourism Centers Improved

14. **That Sikhottabong environmental improvements.** The 29-meter high, golden-tipped That Sikhottabong Stupa is one of Lao PDR's most sacred sites. Currently, tourists that visit the stupa are mostly Thai or Lao religious pilgrims who stay in nearby Thakhek City for 1–3 days and spend \$16 per day. In the without-project scenario this situation is assumed to remain the same. In the with-project scenario, a conservative assumption is made that environmental improvements and the upgrading of facilities will lengthen the stay of all tourists by 0.5 days. Average daily spending is assumed to remain at \$16. The base case EIRR is 32.3%. The sensitivity analysis shows that the subproject overall remains economically viable for all adverse variations with EIRRs ranging from 25.8% to 31.3%. The summary results of the economic analysis and sensitivity tests are shown below.

Summary Indicators						
Subproject and Scenario	Population of Subproject Area	Economic Cost (KN million)	EIRR (%)	NPV (KN million)	SV	SI
<b>1 Xang Cave Access Improvements</b>	1,900	22,400				
Base Case			13.2	2,570		
10% decrease in tourists			12.2	469	12.2	8.17
10% decrease in foreign tourist spending			12.6	1,262	19.7	5.09
10% increase in investment cost			12.5	1,085	17.3	5.78
1-year delay in project implementation			13.1	2,351	117.5	0.85
<b>2 Chompet Heritage District Access Improvements</b>	2,100	27,180				
Base Case			14.1	5,713		
10% decrease in tourists			12.5	1,401	13.3	1.16
10% decrease in foreign tourist spending			13.0	2,549	18.1	1.26
10% increase in investment cost			13.4	4,066	34.7	0.17
1-year delay in project implementation			14.0	5,400	182.7	0.66
<b>3 Ban Xang Hai–Pak Ou–Tham Ting Caves Access Improvements</b>	2,950	57,860				
Base Case			37.8	154,434		
10% decrease in tourists			20.6	49,598	14.7	6.79
10% decrease in foreign tourist spending			23.5	69,626	18.2	5.49
10% increase in investment cost			35.6	150,956	444.0	0.23
1-year delay in project implementation			33.9	144,068	149.0	0.67
<b>4 Chom Ong Cave Access Improvements</b>	8,000	111,090				
Base Case			13.0	8,462		
10% decrease in tourists			12.9	8,271	442.6	0.23
10% decrease in foreign tourist spending			13.0	8,303	532.7	0.19
10% increase in investment cost			12.1	1,321	11.9	8.44
1-year delay in project implementation			12.9	7,737	116.6	0.86
<b>5 That Sikhottabong Environment Improvement</b>	35,000	9,370				
Base Case			32.3	34,440		
10% decrease in tourists			25.8	20,639	25.0	4.01
10% decrease in foreign tourist spending			30.1	30,347	84.2	1.19
10% increase in investment cost			31.0	33,875	609.4	0.16
1-year delay in project implementation			31.3	33,925	669.2	0.15

EIRR = economic internal rate of return, NPV = net present value, SI = sensitivity indicator, SV = switching value,  
Source: Asian Development Bank estimates.