



Department of Planning and Finance,  
Ministry of Natural Resources and Environment of Lao PDR

**switchasia**  
REGIONAL POLICY ADVOCACY



# SCOPING PAPER ON SUSTAINABLE CONSUMPTION AND PRODUCTION (SCP) FOR LAO PDR

2022





## **SUGGESTED CITATION**

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The Scoping Study was developed to strengthen The Ministry of Natural Resources and Environment in mainstreaming SCP into the national development and sectoral action plans in Lao PDR and the process of developing the Scope study aimed at engaging multi-stakeholders and enhancing their understanding and knowledge on SCP. The discussion and recommendations were also taken into consideration to further develop the National SCP Roadmap which will facilitate the implementation of the SCP. This was also an opportunity to promote SDG with possible roles and responsibilities and raise their overall awareness in Lao PDR.

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# 1. Introduction

The Lao People's Democratic Republic (Lao PDR) is a land-locked, ethnically diverse, and mountainous country with an estimated population of around 6.5 million. Strong economic growth has enabled Lao PDR to move from the ranks of low income economies to a "lower middle-income" country from 2010. Lao PDR aims to graduate from Least Developed Country (LDC) status by 2020. With economic growth still heavily reliant on natural resources, the Government is diversifying to move towards more inclusive and sustained growth. More than half of the population are under the age of 25 years. To benefit from the demographic dividend to the economy, the Government is prioritizing the enhancement of skills and knowledge among youth. (APRSCP and SWITCH-Asia RPAC, 2021).

Lao PDR has achieved rapid economic growth, averaging 7.9% GDP growth during its 7th Five-Year National Social Economic Development Plan (NSED) 2011-2015. The population under the national poverty line has reduced from 45% in 1992 to 23% in 2012 (World Bank, 2018). After 2015, poverty rate decreased by 19.7%. Nevertheless, economic growth patterns with heavy reliance on natural resources use has posed several socioeconomic and environmental challenges, in terms of inequity, ecological degradation, delayed private sector development, and falling behind in human development. Moreover, as lifestyles transition from rural to urban, sustainable resource management and usage in Lao PDR has become an increasing concern.

Currently, only 30–50% of the waste in the capital Vientiane is collected. The collected waste goes to landfill, but for the wastes that are not collected, households normally rely on dumping and burning waste (CCAC, 2015)<sup>1</sup>. Single use plastic waste is particularly increasing as the average lifestyles change towards urbanized living. In Vientiane Capital Region alone, the residents generate 35 tonnes of plastic waste everyday (UN, 2019)<sup>2</sup>. Plastic pollution generated in Lao PDR threatens the environment of the Mekong River which serves a vital role in people's lives all along the river from Cambodia to Vietnam. Moreover, the Mekong River is one of the top ten rivers globally discharging plastic into the world's oceans. Thus, addressing the reduction of plastic waste in Lao PDR in its lifestyles transition towards urbanization is an urgent task.

Increasingly, Lao PDR is facing new challenges in its changing production and consumption patterns as the society gradually evolves towards urbanized lifestyles, especially in the Vientiane Capital region. In this context, sustainable consumption and production (SCP) will play a vital role for Lao PDR to ensure that its transition towards urbanized living is environmentally and socially sustainable. Mainstreaming SCP into national policy making and socioeconomic development planning is key to ensure the uptake of SCP in the Lao PDR context as it pursue its commitment on graduating the country out of the Least Developed Country (LDC) group by 2020.

<sup>1</sup> [https://www.waste.ccacoalition.org/sites/default/files/files/vientiane-city\\_profile\\_vientiane\\_capital\\_lao.pdf](https://www.waste.ccacoalition.org/sites/default/files/files/vientiane-city_profile_vientiane_capital_lao.pdf)

<sup>2</sup> <https://uninlaopdr.exposure.co/dashing-upstream>

## 2. Relevance

The Lao PDR Vision to 2030 and its 10-year Strategy (2016-2025), as well as the five-year 9th National Socio-economic Development Plan (NSED) 2021-2025 and the National Green Growth Strategy for 2030, all clearly identified policy priorities transitioning to a greener development model towards increase human capacity, regional and international integration, and sustainable development. One of the three outcomes of the 9th NSED is to effectively protect natural resources and the environment according to green growth and sustainability principles, as well as increasing resilience to climate change and natural disasters. It is significant, however, that the single reference to SCP in the 8th plan is in relation to Lao PDR's 18 sustainable development goals (SDGs) and plastic pollution is not mentioned.

Lao PDR's submission of their Voluntary National Review (VNR) of the Implementation of the 2030 Agenda for Sustainable Development last June 2018 emphasised that policy and operational frameworks on Sustainable Development Goals (SDG) 12 are inadequate because of the relative newness of SCP in Lao PDR. It stated recommendations for way forward which includes addressing the need for both policy makers and the public to be made aware of SCP and for the national policy framework on SCP be mainstreamed within existing frameworks. Progress on SDG 12 for the Lao PDR will mean fortifying the long-term results for progress on other SDGs, which depend strongly on the efficient use and sustainable management of natural resources.

In the Multi-Stakeholder Consultation (MSC) organized by the SWITCH-Asia Programme on SCP with MoNRE and the Delegation of the European Union to Lao PDR last 28 March 2019 in Vientiane, Lao PDR, the analysis of the background study prepared stated that (1) existing policy frameworks have touched upon a wide variety of entry points within SCP, but more detailed implementation mechanisms including coordination and resource allocation would be needed for implementation at the local level; (2) incorporating SCP thinking into implementation of existing plans would generate bigger benefits, as the objectives of SCP overlap with the objectives of those frameworks not only for environmental sustainability but also for poverty eradication, economic development and inclusive growth; (3) monitoring and evaluation, and data collection mechanisms need to be strengthened at all levels; and (4) nurturing local talent from policy making to private sector initiatives is a key factor in facilitating SCP implementation and generating co-benefits that will enhance human development.

The Ministry of Natural Resources and Environment (MoNRE) of Lao PDR serves as the focal point for SCP in Lao PDR to coordinate with other government agencies and stakeholders in implementation. Multiple government policies and strategies have touched upon diverse aspects of SCP as it pursues green growth, climate change mitigation, and the SDGs. The preparation for the 9th NSED 2021-2025 being led by the Ministry of Planning and Investments and in collaboration and coordination with line ministries, including as well as between central and local authorities has been initiated in November 2019 with expected endorsement by the end of 2020. The plan focuses on maximizing competitive advantages as a cornerstone to socio-economic development, LDC graduation and achievement of the SDGs. Responsible production and consumption through Circular Economy (CE) is mentioned as strategy under the pillar of Environmental Sustainability. As the contribution of ministerial, sectoral and provincial plans is ongoing this year, there is an opportunity for MoNRE to develop a National SCP Roadmap and for this to be mainstreamed in the 9th NSED 2021-2025 and in sectoral strategies.

Based on the results of the Multi-Stakeholder Consultation conducted and in reference to the meeting among representatives of the Lao PDR National Focal Point on SCP, the SWITCH-Asia SCP Facility and the EU Delegation to Lao PDR at the SWITCH-Asia Network Event in Hanoi, Vietnam last 22 November 2019, a list of prioritized areas were identified for implementation under the SWITCH-Asia Programme. Among those, three tasks emerged that require more support in national policy making processes:



1. A National Roadmap on SCP;
2. Policy assessment on plastic regulation; and
3. Policy support to mainstream SCP into the 10<sup>th</sup> NSEDP.

## 2.1 Target audience on the scope of SCP in Lao PDR

This report is intended as a background paper for Lao PDR to consider in shaping the development path of the country. In particular the Ministry of Planning and Investment (MPI) can treat this paper as a guide in pursuing further studies regarding identified sectors and aspects which could merit further prioritization in terms of investments, employment, and research/ study. To achieve growth that is felt by all sectors of society, a common development goal and close coordination among various agencies will be needed. As this report provides discussions on crosscutting themes of economy, environment and society, the three pillars of sustainable development, the Ministry of Finance, Ministry of Forest, Ministry of Agriculture, Ministry of Transportation, Ministry of Energy and Mines, and Ministry of Natural Resource and Environment are also the intended audience. This paper can also serve as a technical support for the legislative body of the country.

## 2.2 Methodology

This scope gathers data and information mainly from primary sources such as the Ministries and relevant offices, and government reports. Calculated data and research done by international institutions are also referenced whenever necessary. These works and sources are cited throughout this document. The results presented in Section 4.5 are a product of the Consultant's work with a team of researchers. Finally, recommendations were drafted based on basic data on the economy, environment and development of Lao PDR.

## 3. Macro-economic profile of Lao PDR

### 3.1 Basic macroeconomic figures

As with most Asian economies, the economy of Lao PDR demonstrated growth in the past years. Even with the financial crisis in 2008, annual economic growth remained high at 7.6-7.9% from 2008 to 2010. The increase in gross domestic product (GDP) is driven primarily by the industry sector to which mining and energy have contributed significantly in recent years. This sudden development in these two subsectors can be explained by the share in investment that these received – nearly 66% of investments in industry or roughly 38% of total investments. The service sector remains strong while agriculture sector posted a modest growth.

**Table 1. Socioeconomic profile of Lao PDR**

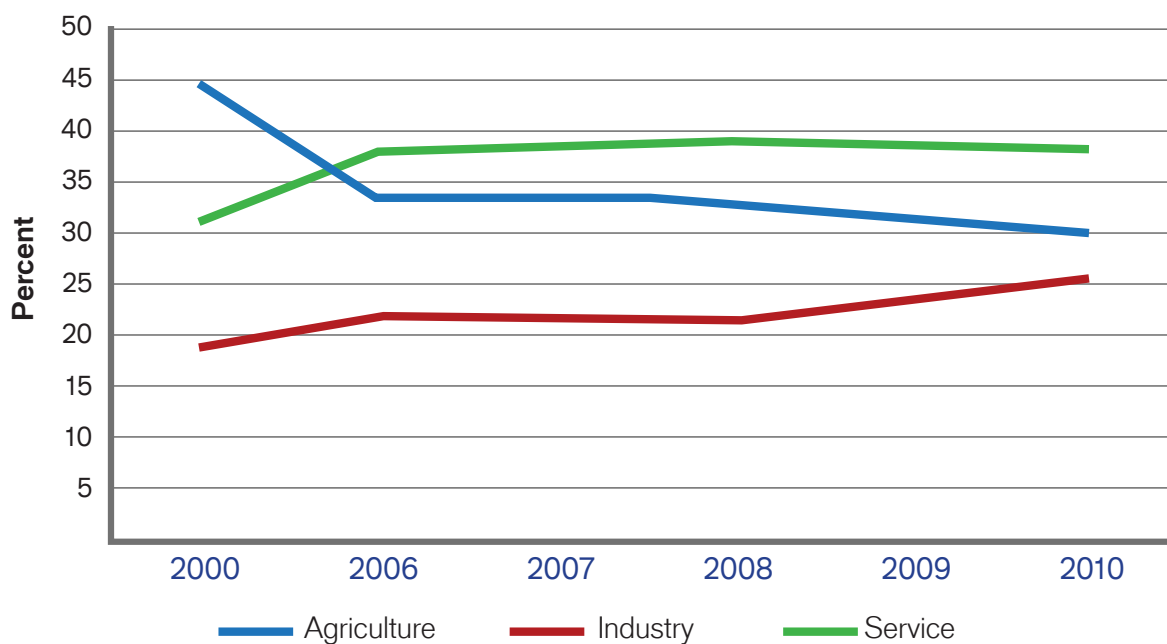
Indicator	2000	2006	2007	2008	2009	2010
GDP, billion Kips <sup>a</sup> (constant 2002 price)	15,815	23,313	24,684	26,609	28,623	30,898
GDP growth, % <sup>a</sup>	6.3	8.6	5.9	7.8	7.6	7.9
Agriculture	4.2	2.5	6.5	4.9	3.0	3.0
Industry	9.3	14.1	3.3	9	16.6	17.7
Service	6.9	9.7	6.8	9.5	6.9	6.7
Investment (1,000 USD) <sup>b</sup>		2,699,691	1,136,903	1,440,815	4,312,887	1,882,194
FDI			971,412	1,179,230	3,448,038	1,701,074
FDI, %			85.4	81.8	79.9	90.4
GNI per capita, USD <sup>c</sup>	280	530	620	770	920	1,050
GNI per capita, PPP <sup>d</sup>	1,140	1,770	1,970	2,120	2,330	2,460
Employment, % <sup>a</sup>		95.0 (2001)	95.0 (2002)	94.9 (2003)		98.6 (2005)
Ginicoefficient <sup>e</sup>	32.63 (2002)			36.74		
Inflation rate, % <sup>f</sup>	25.1	6.8	4.5	7.6	0	6.0
Population <sup>g</sup>		5,747,587	5,873,616	6,000,379	6,127,910	6,256,197

Source: <sup>a</sup> (ADB, 2011); <sup>b</sup> (Lao Statistics Bureau, n.d.-a); <sup>c</sup> (WB, n.d.-a); <sup>d</sup> (WB, n.d.-b); <sup>e</sup> (WB, 2012); <sup>f</sup> (WB, n.d.-c); <sup>g</sup> (Lao Statistics Bureau, n.d.-b)

Gross national income (GNI) per capita is shown to have improved, but income inequality is still prevalent as evidenced by the Gini coefficient. Inequality is higher in urban areas than in rural areas as suggested by results of the Lao Expenditure and Consumption Survey (LECS) done at 5-year intervals from 1992-2007 (Lao Statistics Bureau, n.d.-c). Inflation rate managed to stay at 6.0% in 2010. Employment is high at 98.6% in 2005. Although the population is increasing, population density is still low at about 26 people per km<sup>2</sup> (Lao Statistics Bureau, n.d.-d) compared to neighboring countries such as Cambodia and Viet Nam which have around 80 and 280 people per km<sup>2</sup>, respectively.

### 3.2 Important economic sectors in terms of GDP, employment and investments

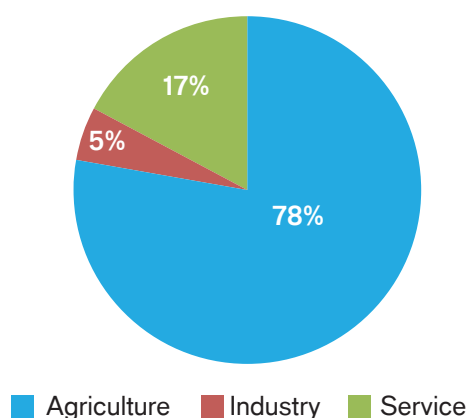
Though the industry sector has recorded significant growth rates in the past years, the service sector of the country constitute 38.2% of GDP output, followed by agriculture at 29.9% and industry sector at 25.4%. Both the GDP share of industry and service sectors have been gradually increasing, whereas it is downhill for agriculture (44.5% in 2000 against 29.9% in 2010).



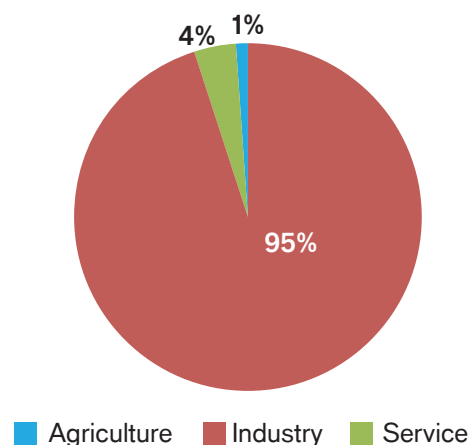
**Figure 1: Percentage share of economic sector to GDP**

Source: (ADB, 2011)

**Employment by Sector, 2005**



**Investment by Sector, 2005**



**Figure 2: Employment<sup>a</sup> and investment<sup>b</sup> by sector, 2005**

Source: <sup>a</sup> (National Statistics Centre, 2006); <sup>b</sup> (Lao Statistics Bureau, n.d.-a)



In terms of employment, at least three-fourths of the labor force is engaged in agriculture sector, 17% in service sector, and only 5% in industry as of 2005. In 2001, employment in agriculture is higher at 82.7% of the labor force (National Statistics Centre, 2006). The large percentage of labor in agriculture is not complemented by the bleak investment in the sector. While investment in agriculture rose to 8.9% of total investments in 2010 from 1.4% in 2005, it reached a high level of 17% in 2006 (Lao Statistics Bureau, n.d.-a). On the other hand, the industry sector received 95% of the total investments that poured in the country in 2005, while it only employed 5% of the labor force. The disproportion of the employment and investment rate shows the opportunity available for the local labor to develop industry-specific skills that could potentially shift employment towards the industry sector which receives financial attention and GDP growth.

### 3.3 Economic development policies and plans of Lao PDR

Lao PDR is committed to the 2030 Agenda for Sustainable Development. The country's Prime Minister is Chairman of the National Steering Committee overseeing the implementation of the Sustainable Development Goals (SDGs) in Lao PDR. This included localizing the SDGs and integrating them into the country's National Socio-Economic Development Plan (NSED) in 2016, with around 60 percent of the 160 NSED indicators linked to the SDGs. The three dimensions of sustainable development relating to an NSED outcome are economic, social, and environmental, with specific outputs, targets, and indicators defined for each outcome. Institutional strengthening and partnership development are key components of the SDG Roadmap, with emphasis placed on awareness-raising strategies; multi-stakeholder consultations and dialogue; mechanisms to create horizontal and vertical policy coherence; budgeting for the future; and plans for monitoring, reporting and accountability.

The Green Growth program's vision for 2030 is to build the foundation for planning green growth and monitoring Lao PDR's consolidation of a green growth pathway, beginning with the incorporation of green growth principles at strategic planning and monitoring levels. In April 2016, the National Assembly adopted the 8th Five-Year National Socio-Economic Development Plan (2016-2020) (8<sup>th</sup> NSED), which establishes concrete environmental protection and sustainable natural resource management outcomes and outputs, and lays the foundations for a transition to clean, resource-efficient, and resilient growth.

To drive this transition, the Prime Minister has established the Green Growth National Steering Committee (GGNSC) to guide green growth planning, implementation, monitoring and reporting. The Deputy Prime Minister / Minister of Finance chairs the GGNSC, while the MIP is its Secretariat, and the DOP of the MIP coordinates all GGNSC members, including representatives from MONRE, MAF, MEM, MOIC, and MPWT, among several ministries. The GGNSC will also be responsible for ensuring that the progress and lessons learned are monitored and reported transparently and incorporated into subsequent NSEDs and longer-term plans, including the 9th Five-Year National Socio-Economic Development Plan (2021-2025) (9th NSED). In addition, the government will design a "Green Growth Strategy" and will establish a "Green Growth Development Center" with a mandate to operationalize the strategy by incorporating the priorities defined by key planning and budgeting processes. The National Strategy on Natural Resources and Environment 2016-2025 provides a vision and strategic direction for the development and management of natural resources and the environment, with the goals of ensuring sustainable social-economic development, building the capacity for climate change adaptation and mitigating the risks of natural disasters. This strategy aims to achieve the sustainable utilization and management of natural resources and the environment, thereby improving the health and wealth of all people in

Lao PDR. The important issues have been categorized into five themes:

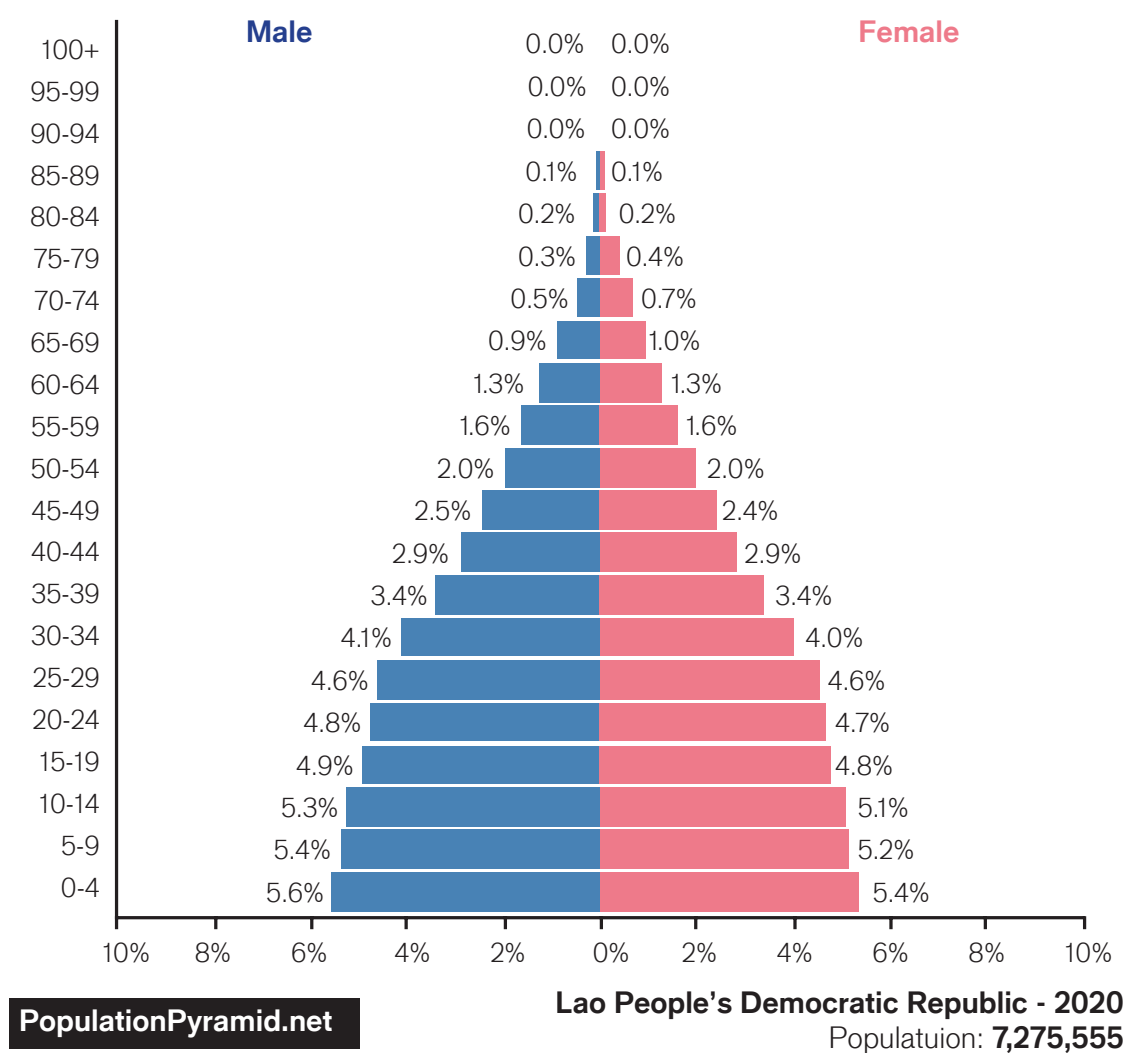
1. Sustainable Management and Planning of the Use of Natural Resources and Environment
2. Sustainable Environmental Planning for City and Rural Development
3. Strengthening the Capacity of Lao PDR on Climate Change Adaptation and Mitigation
4. Maintaining and Enhancing Regional and International Integration
5. Building MONRE Institutional Capacity Effectively, Efficiently and Sustainably.

The economy of the Lao PDR has been growing rapidly since the government began to decentralise control and encourage private enterprise through the New Economic Mechanism (NEM) in 1986. Currently, the economy grows at about 8% per year, and the government is pursuing poverty reduction and education for all children as key goals. The country opened a stock exchange, the Lao Securities Exchange, in 2011, and has become a rising regional player in its role as a hydroelectric power supplier to neighbours such as China, Vietnam, and Thailand.

GDP of Lao PDR was 17.95 billion USD in 2018. And GDP per capita of Lao PDR in 2018 was 2,542.49 USD (World Bank).

Lao PDR has relatively little industry, no heavy industry and much of the country's industry is comprised of small companies. These small establishments are involved primarily in the production of textiles and handicrafts. Laos is well known for the high quality of its aesthetically attractive textiles. Lao SMEs play an important role in the country's economic development. The industries which contribute most to Lao economic development are mainly electricity generation, mining, garments, wood, coffee, and other agricultural products. In addition, tourism has become an important sector for the Lao economy. The agriculture and forestry sector saw average annual growth of 4.1% over the period 2005–2010, accounting for 23.5% of total GDP, while the industry sectors of mining and hydropower grew by 12.5% annually over the same period, and account for 33.2% of total GDP. The service sector also grew by 8.4% per year over the same period, accounting for 37.4% of GDP. (Chapter 8 Sustainable Consumption and Production in Lao PDR, [www.worldscientific.com](http://www.worldscientific.com))

Since 1975, the numerous ethnic groups are often distinguished into three categories according to the geographic areas they occupy: The lowland ethnic groups known as Lao Loum (68%), the midland groups known collectively as the Lao Theung (22%), Lao Sung, including the Hmong and the Yao (9%), and the ethnic Vietnamese/Chinese (1%). (Chapter 8 Sustainable Consumption and Production in Lao PDR, [www.worldscientific.com](http://www.worldscientific.com)). The structure of population is presented as Figure 3



**Figure 3: The Lao PDR's population pyramid for 2020**

Source: (<https://www.populationpyramid.net/lao-peoples-democratic-republic/2020/>)



## 4. Lao PDR resource base

### 4.1 Resource status

#### 4.1.1 Land resource

Lao PDR has a land area of 236,800 km<sup>2</sup>. Forest cover has been on the decline from 70% in 1940 down to 64% in the mid-1960s, and to a low of 47% in 1989 which consequently fell to 41% in 2002 (National Environmental Performance Assessment Report, 2006). On the other hand, land use will be under much pressure with the economic growth of the country that heavily relies on mining and hydropower, both of which take up land space. Forest cover in the country has declined from 49.10% in 1982 to 40.34% in 2010. This is down from some 70% forest cover several decades prior. When combined with further industrial activity, the decline in forest cover transformed the country from a net sequester of CO<sub>2</sub> in 1990 to a net emitter in 2000. The main causes of forest reduction are the shifting of rice cultivation in the northern part of Laos and the unsustainable forest exploitation in the past to cover economic balance. (Chapter 8 Sustainable Consumption and Production in Lao PDR, [www.worldscientific.com](http://www.worldscientific.com))

Based on the (State of the Environment Report, 2016-2020) The government has proposed to the National Assembly to approve the National Land Master Plan in accordance with the resolutions of the National Assembly no. 098 / NA, 28 March 2018, with two main targets and estimates number of land allocation in each type of land into a master plan to 2030 as follows:

#### 1. Land to be reserved and conserved for 70% forest cover, including wetland in the land areas of the country as follows:

- Protection forests area is 4.7 million hectares or 20%;
- Conservation forests (Protected area) is 8.2 million hectares or 35%;
- Production forest area is 3.1 million hectares or 13%;
- Industrial plantation area is 0.5 million hectares or 2%.

#### 2. Land area to be used and developed for 30% including the wetland land in the land area of the country as follows:

##### A. 4.5 million hectares of agricultural land or 19%, which includes:

- Paddy land area is 2.0 million hectares or 8.4%;
- Land planted with weeds or short-lived weeds is 1.0 million hectares or 4.2%;
- Plantation land is 0.8 million hectares or 3.4%;
- Grassland area is 0.7 million hectares or 3.0%.

##### B. 2.56 million hectares of land used for various purposes, or 11% which consist:

- Construction land area is 0.37 million hectares or 1.6%;
- Commercial land area is 0.18 million hectares or 0.8%;
- Other types of land, including industrial, cultural and national defense land is 2.05 million hectares or 8.6%.

The Ministry of Natural Resources and Environment is expected to develop a Land Allocation Plan, a comprehensive management of natural resources and environment by 2030 throughout the country completed in accordance with the deadline set by the National Assembly Resolution No. 098 / NA, 28th March 2018 also paid attention to the registration of 1.6 million land titles in 2025 as an estimate number set by the government.

### 4.1.2 Agriculture

Land productivity of Lao PDR in comparison to other Asian countries in terms of various crops is presented by Lao PDR has a competitive rate of productivity in terms of maize and tobacco compared to neighboring countries. However, productivity lags behind in terms of rice and sugarcane. Rice, maize and sugarcane are the top three agriculture products produced by the country. (<https://laos.opendevelopmentmekong.net/topics/environment-and-natural-resources/>)

**Table 2. Comparison of land productivity of various countries and crops in Hg/Ha, 2010**

Crops	Lao PDR	Cambodia	Myanmar	Thailand	Viet Nam
Banana	118,627	66,807		118,695	148,735
Maize	49,152	42,732	36,364	39,708	40,899
Rice	34,552	29,697	41,239	28,751	53,221
Sugarcane	313,449	214,125	539,746	703,588	598,828
Tobacco	44,769	14,535	14,326	19,227	17,955

Source: (FAO, 2012)

The increased use of agricultural chemicals to facilitate the expansion of agricultural land, tree plantations, and mineral extraction. For example, the rapid development of large-scale industrial rubber and pulpwood plantations, with low labor inputs, has been facilitated through the use of substantial amounts of fertilizers and herbicides. These agricultural chemicals caused health problems for workers and concerns about sourcing drinking water from polluted sources, such as streams.

### 4.1.3 Minerals

Lao PDR has abundant mineral reserves which are recently being tapped to contribute to overall economic wellbeing of the country. Coal, limestone, gold and tin are among the minerals available in Lao soil. A survey of the available reserves is given in the Appendix. In 2009, mining generated around 1.6 billion USD investment and 1,837 billion kip of GDP output.

### 4.1.4 Energy: Hydropower

Having a significant potential in hydropower generation, electricity demand is met by hydropower generation. Power consumption increased from 70.57 ktoe (kilotons oil equivalent) in 1990 to 726.63 ktoe in 2010. Despite this tenfold increase within 20 years, the hydropower capacity was able to expand to continuously supply the energy requirements of the country and even export. As of October 2011, installed capacity of small hydropower projects (less than 15 MW) reached 23 MW whereas the technical potential of the country is estimated at 26,000 MW excluding small-scale projects (Lao People's Democratic Republic, 2011).

While hydropower is the most important energy resource of the country, biomass and solar energy have some potential for development. Roughly 216 MTOE could be generated from livestock waste, whereas 13 MTOE/km<sup>2</sup>/year is the potential for solar energy (Lao People's Democratic Republic, 2011).

### 4.1.5 Water resources

Lao PDR is a country rich in water and water resources, with many rivers. The main rivers are the Mekong and its tributaries, with more than 62 basins. There are 14 large water basins; 19 medium-sized watersheds; Basin Nam Kha Astringent more than 29 basins. In addition, there are 90 reservoirs from the hydropower project. Basins, located in the 22 basins, 50 basins in the central region and 18 basins in the south, can respond to Reservoirs for agricultural production through irrigation systems, potentially for electricity generation.

Water management and water resources are aimed at the management, use, and conservation of water resources. Identify and protect water resources, water resources, and the environment in a green and sustainable manner; Comply with the national socioeconomic development plan, Water Resources Management Strategic Plan, Basin Management Plan Water Resources, Strategic Environmental Assessment, Integrated Water Resources Management and Work National Defense and Security; Take the protection of water and water resources as a principle and rehabilitation of water and water resources is important; Recognize the involvement of individuals, legal entities and relevant arrangements for the planning, development, use and protection of water resources and provide water resources. Integrated water resources management has been implemented in 10 river basins. Prioritize national socioeconomic development in Nam Ou, Nam Ngie, Xe Fai, Xeang Hieng, Nam Ngiep, Nam Theun-Kading, Nam Ma, Nam Sam, Sedon and Sekong.

Lao PDR has the highest per capita freshwater availability in Asia at 32,000 m<sup>3</sup> Total annual water availability is about 270 billion m<sup>3</sup> (Government of the Lao PDR; United Nations, 2008). Access to safe drinking water in the country and forecast up to 2020 is provided in. Around half of the rural population still does not have clean water. Targeted national water supply/ coverage is 90% in 2020.

**Table 3. Water supply in Lao PDR**

Percent/year	1998	2000	2002	2004	2006	2007	2010	2015	2020
<b>Urban</b>	77	75.5	66	75	86	-	-	-	-
<b>Rural</b>	45	37.6	38	60.1	53	-	-	-	-
<b>Total</b>	50	52	58.1	63.8	60	66	-77.5	-	-
<b>Forecast</b>	-	-	-	-	-	66	75	85	90

Source: Report on strategy and program of public health, 2006-2010, health statistic, department of planning and finance, Ministry of public health 2009-2010.



## 4.2 Policies for resource use and management in Lao PDR

Presents some laws pertaining to the environmental management and pollution control in Lao PDR. While these may appear an inexhaustible list, there are other policies, sector-based approach and action plans formulated that provide the framework for managing specific environmental aspects such as water, biodiversity, agriculture and forestry.

**Table 4: Laws on environment and natural resources management**

Aspect	Law
<b>Environmental Management</b>	Environmental Protection Law (2013)
	Decree on Environmental Impact Assessment (2019)
	Implementing Decree of EPL (2002)
	National Strategy on Environment (2004)
<b>Forest</b>	Forestry Law (2019)
<b>Land</b>	Land Law (2019)
<b>Mineral</b>	Mining Law (2017)
	Mining Law Implementing Decree (2002)
	Regulation Regarding Environmental Protection and Management of Mining in the Lao PDR (2004)
<b>Water</b>	Water and Water Resource Law (2017)
<b>Energy</b>	Electricity Law (2017)
	National Policy on Environmental and Social Sustainability of the Hydropower Sector in Lao PDR (2005)
<b>Industry/ Pollution</b>	Industrial Waste Discharge Regulation (1994)
	Industrial Law (2013)

## 4.3 Potential on Green Public Procurement (GPP) initiation

For public procurement, (TEI, 2021) a Decree of the Prime Minister on Government Procurement of Goods, Works, Maintenance and Services, No. 03/PM, dated January 09, 2004 sets the rules, forms and procedures for government procurement of goods, construction, repair and services and ensures efficiency, transparency and economy in government procurement. It liberalizes and promotes equality among all economic sectors in the procurement of goods, construction, repair and services by state organizations and state enterprises. However, the public procurement of goods, works and services financed in full by domestic funds will give priority to local firms, which is a limitation of this decree, whereby the use of the national budget for the procurement of foreign goods will not be authorized if such goods may be produced locally of equal quality. Local firms that are not affiliated to foreign firms and have the capacity to supply goods, works and services of equal quality will be given preferential rights in competitive biddings. Later the Law on Public Procurement No. 30/NA, 2017 and 2019 was announced in order to elaborate on the preparation of procurement planning; the thresholds; the timeline required for the advertisement/notification of the procurement of goods, works, services and consulting services; the procedures and implementing rules for each method of procurement and the selection of consultants and tender committees; the evaluation of bids/proposals; securities (guarantees); and other contents as stipulated in the Law with the aim of ensuring that such law is implemented in a proper, efficient,

effective, and unified manner countrywide<sup>3</sup>. Article 4 of the Government Policy on Public Procurement states that the government promotes public procurement by protecting customer rights and preserving the environment for green sustainability.

Although Green Public Procurement has not yet been implemented in Lao PDR, there are some supporting initiatives like National Assembly no.10/PO (1999), the Promulgation of the Law on Industrial Processing and the SME Development Plan 2016–2020 that can encourage green production which in turn leads to environmentally-friendly products entering the market. The Law on the Processing Industry No. 01-99/NA determines the principles, regulations, and measures relating to the establishment, operation, and administration of industrial and handicraft processing activities in order to expand the processing and handicraft industry; interrelate the processing industry with agro-forestry; transform the natural economy of farmers into a goods-based economy; and interrelate the economic structures of the agro-forestry, industry and service sectors to increase the living standards of the multi-ethnic people. This law applies to the administration, inspection, and promotion of the development of industrial and handicraft processing factory operations. In order to ensure that industrial and handicraft processing yield high productivity, the promotion of this sector must be comprehensive, including:

- |                                                                                                                                                                                                                                              |                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Capital or funds                                                                                                                                                                                                                          | 7. Privileges                                                                                                                                                                                         |
| 2. Technology and machinery: The State promotes the use of advanced and suitable technology and machinery in the field of industrial and handicraft processing to ensure productivity and to avoid or reduce [adverse] environmental impact. | 8. Customs and tax privileges: The State provides incentives for industrial and handicrafts processing operations, primarily for those operations that the government considers having high priority. |
| 3. Techniques                                                                                                                                                                                                                                | 9. Protection of domestically produced products                                                                                                                                                       |
| 4. Vocational training                                                                                                                                                                                                                       | 10. Marketing: The State encourages and promotes all sectors of the economy to seek out domestic and foreign markets in which to distribute industrial and handicraft processing products.            |
| 5. Supply of information and data                                                                                                                                                                                                            |                                                                                                                                                                                                       |
| 6. Facilitation Figure 12 Policies and Legislation Framework for SCP in Lao PDR <sup>35</sup>                                                                                                                                                |                                                                                                                                                                                                       |

Moreover, concern for the environment has been included in the following articles: Article 4. Industrial and handicrafts processing operations must ensure environmental protection as provided for in the Law on Environmental Protection. Article 18. Factory operations must adhere to the Law on Environmental Protection, the Urban Planning Law, and regulations issued by the Ministry of Industry and Handicrafts. Article 19. All types of factory waste and wastewater must be disposed of and treated according to the method and at the place determined by regulations. Article 20. The establishment and operation of a factory, including its transportation, storage and use of toxic chemicals, must avoid or mitigate the impact of traffic, sound, light, [colouring agents], toxic fumes, dust, smoke, vibrations, temperature, moisture, and other related factors, on the social and natural environment, as provided for in the Law on Environmental Protection and regulations issued by the Ministry of Industry and Handicrafts.

For SMEs, the key objectives of the SME Development Plan 2016-2020 are (i) to improve the enabling environment for SMEs; (ii) to enhance the competitiveness and sustainable growth of Lao SMEs, and (ii) to enable their integration into regional (especially the ASEAN Economic Community) and international markets.

<sup>3</sup> Instruction on Implementation of Law on Public Procurement, MOF (Law on Public Procurement, 2019)

Therefore, the SME Development Plan 2016-2020 covers 7 policies, which contribute to the social economic development of Lao PDR:

1. The Promotion of Productivity, Technology and Innovation;
2. The Promotion of Access to Finance;
3. The Promotion of Access to Business Development Services;
4. The Enhancement of Market Access and Expansion;
5. The Strengthening of Entrepreneurial Development;
6. The Policy to Create a Favourable Environment for Businesses; and
7. Policies on Customs and Taxation officially Endorsed by the Prime Minister Decree No. 253/PM, dated January 18<sup>th</sup> 2017.

In the framework of domestic trade in the field of consumer protection in the consumption of goods and services in the market, the National Assembly has also adopted the Law on Consumer Protection, Ref. No. 02/NA, dated 30 June 2020. In this case, the principles, rules, and measures on the implementation, management, monitoring, and inspection are defined. Consumer protection activities are monitored to ensure that the benefits and safety from negative impacts due to sales and service quality are standardized, accurate and consistent with regulations. One of the basic principles of consumer protection is to ensure the safety of the life, health, property, [protection of] legitimate rights and interests of the consumer while conserving the environment and promoting sustainable consumption. In conclusion, the Lao PDR Government's Green Growth Strategy potentially fits with SDG 12. However, the relationship between sustainable consumption and production in Lao PDR means that policy and operational frameworks are inadequate. Both policy makers and the public need to be aware of SDG 12. The national policy framework on sustainable consumption and production should fit with existing frameworks. To this end, MONRE is in the process of identifying Green Procurement guidelines and indicators that will fit into the Lao context. Moreover, SMEs will need to develop their human resources and skills, while government entities and SMEs will need access to the best available technologies and environmental practices, innovations, and marketing tools.

## 4.4 Environmental impacts of economic development

This section quantifies the air emissions (greenhouse gases and other air indexes), waste generation, land use change and water quality resulting from the utilization of the environment and natural resources.

### 4.4.1 GHG emissions

Greenhouse gas (GHG) emissions of the country increased from being a sink by as much as 97,437.27 Gg of CO<sub>2</sub>e in 1990 to emitting 52,856.77 Gg of CO<sub>2</sub>e in 2000. The observed increase is largely due to land use change and forestry where a positive value was recorded instead of maintaining the previous capacity of forests as a sink. While energy, industrial processes and agriculture also followed with incremental increase in GHG emissions, waste registered a decrease in the amount of emissions.

**Table 5. Total greenhouse gas emissions in Gg CO<sub>2</sub>e, 1990 and 2000**

Category	1990 <sup>a</sup>	2000 <sup>b</sup>
Energy	929.86	1,041.54
Industrial Processes		38.95
Agriculture	5,696.67	7,675.79
Land-Use Change and Forestry	-104,303.83	43,966.18
Waste	240.03	134.31
Total	-97,437.27	52,856.77

Source: <sup>a</sup> (First National Communication on Climate Change); <sup>b</sup> (MONRE, 2012)

#### 4.4.2 Atmosphere quality

In accordance with the World Health Organization's guidelines, the air quality in Laos is considered **moderately unsafe** - the most recent data indicates the country's annual mean concentration of PM2.5 is 25 µg/m<sup>3</sup>, exceeds the recommended maximum of 10 µg/m<sup>3</sup>. Currently, Ministry of Natural Resources and Environment has installed the automatic air quality monitoring (PM2.5) in 9 stations over Lao PDR as detail show in table.

**Table 6: Gases emission species data that available from monitoring station in Lao PDR**

Province	Station	Date / year	Parameters						
			CO (ppm)	NO2 (ppm)	SO2 (ppm)	PM2.5 (mg/m <sup>3</sup> )	PM10 (mg/m <sup>3</sup> )	TSP (mg/m <sup>3</sup> )	O3 (mg/m <sup>3</sup> )
Xayyaboury	XYL-Station-01 (MH Office)	19-20/11/2018	0.568	0.000		0.0153		0.0445	NA
		20-21/11/2018	0.722			0.0182		0.0464	
		21-22/11/2018	0.540			0.0167		0.0449	
	XYL-Station-02 (Samamluang)	22-23/11/2018	0.650			0.0153		0.0321	
		23-24/11/2018	0.619			0.0135		0.0280	
		24-25/11/2018	0.526			0.0190		0.0449	
	Average		0.604	0.000	0.00	0.016	NA	0.040	NA
Oudomxay	ODX-Station-01 (MH Office, Xay district)	11-12/04/2019	0.568			0.135		0.189	
		12-13/04/2019	0.722			0.180		0.230	
		13-14/04/2019	0.540			0.134		0.192	
	ODX-Station-02 (Kaysone Memorial)	14-15/04/2019	0.650			0.123		0.165	
		15-16/04/2019	0.619			0.118		0.163	
		16-17/04/2019	0.526			0.129		0.174	
	ODX-Station-03 (Houn district)	18-19/04/2019	0.769			0.202		0.124	
		19-20/04/2019	0.649			0.144		0.146	
		20-21/04/2019	0.385			0.142		0.101	
	Average		0.603	0.000	0.00	0.145	NA	0.165	
Borkeo	BK-MH office	22-23/03/2019	0.626			0.155		0.043	
		23-24/03/2019	0.498			0.133		0.203	
		24-25/03/2019	0.896			0.212		0.321	
	Phaoudom district	26-27/03/2019	0.597			0.102		0.147	
		27-28/03/2019	0.252			0.094		0.139	
		28-29/03/2019	0.522			0.119		0.146	
	BK-Samosone	29-30/03/2019	0.545			0.126		0.166	
		30-31/03/2019	1.102			0.217		0.257	
			0.630	0.000	0.00	0.145	NA	0.178	NA
	Average		0.604	0.000	0.00	0.027	NA	0.122	NA
Luangprabang	LPB-station-01 (MH office)	26-27/11/2018	0.568			0.0000		0.3265	
		27-28/11/2018	0.722			0.0439		0.1173	
		28-29/11/2018	0.540			0.0519		0.1310	
	LPB-station-02 (Vatmai)	29-30/11/2018	0.650			0.0279		0.0581	
		01-02/12/2018	0.619			0.0225		0.0543	
		01-02/12/2018	0.526			0.0160		0.0418	
	Average		0.604	0.000	0.00	0.027	NA	0.122	NA



Province	Station	Date / year	Parameters						
			CO (ppm)	NO2 (ppm)	SO2 (ppm)	PM2.5 (mg/m3)	PM10 (mg/m3)	TSP (mg/m3)	O3 (mg/m3)
Luangnamtha	LNT-Station-01 ( Sing district)	01-02/04/2019	0.667			0.187		0.339	
		02-03/04/2019	0.439			0.187		0.382	
		03-04/04/2019	0.546			0.187		0.427	
	LNT-Station-02 (Luangnamtha district)	05-06/04/2019	0.411			0.091		0.148	
		06-07/04/2019	0.164			0.073		0.117	
		06-07/04/2019	0.143			0.079		0.133	
	LNT-Station-03 (Provincial governor office)	08-09/04/2019	0.280			0.121		0.080	
		09-10/04/2019	0.360			0.135		0.095	
		10-11/04/2019	0.208			0.141		0.101	
	Average		0.358	0.000	0.00	0.134	NA	0.202	NA
Phongsaly	PSL-station-01 (MH Office)	14-15/03/2019	0.207			0.094		0.136	
		15-16/03/2019	0.409			0.118		0.185	
		16-17/03/2019	0.472			0.138		0.180	
	PSL-station-02 (PSL stadium)	17-18/03/2019	0.304			0.117		0.165	
		18-19/03/2019	0.137			0.081		0.115	
		19-20/03/2019	0.073			0.085		0.085	
	Average		0.267	0.000	0.00	0.106	NA	0.144	NA
Bolikhamxay	(MH office) in 2018		0.037	0.000	0.009	NA	0.016	0.033	NA
	(Sysomphone memorial) in 218		1.051	0.004	0.001	NA	0.012	NA	0.014
Khammouan	(MH office) 2018		0.037	0.003	0.000	NA	0.024	0.033	NA
	(Souphanouvong memorial) 2018		0.508	0.003	0.004	NA	0.055	NA	0.012
Savanakhet	station-01 (MH office) 2018		0.070	0.000	0.001	NA	0.018	0.033	NA
	Station-02 (Nouhuk memorial) 2018		0.885	0.003	0.002	NA	0.020	NA	0.048
Champasack	(MH office) 2018		0.042	0.000	0.000	NA	0.027	0.041	NA
	(Teacher training college) 2018		0.703	0.005	0.000	NA	0.047	NA	0.009
Vientiane Capital	VTE-Chaoanouvaong 2018		3.925	0.032	0.001	0.063	0.145	0.171	0.053
	VTE-National Hall luk6 2018		1.330	0.035	0.002	0.178	0.102	0.116	0.033

Source: (aim-MONRE.gov.la, n.d.)

**Table 7: Ambient air quality standard (Lao PDR) \***

Parameters	Average	Standard Limit	Unit
Carbon monoxide CO	1 hour	30	ppm
	8 hours	9	Ppm
Nitrogen dioxide NO2	1 hour	0.11	Ppm
	1 year	0.02	ppm
Sulfur dioxide SO2	1 hour	0.13	ppm
	24 hours	0.05	ppm
Total Suspended < 100 micron TSP	24 hours	0.33	mg/m3
	1 year	0.10	mg/m3
Particulate Matter < 10 micron PM-10	24 hours	0.12	mg/m3
	1 year	0.05	mg/m3
Particulate Matter 2.5 PM-2.5	24 hours	0.05	mg/m3
	1 year	0.015	mg/m3
Ozone O3	1 hour	0.20	mg/m3
	8 hours	0.14	mg/m3

(\*) Decision on National Environmental Standards, No. 0832/MONRE, Vientiane 3 March 2017

#### 4.4.3 Waste generation

Garbage storage in urban areas can be stored and disposed of in only 60-65%, the rest it is at the disposal of the people that the service is not available and some families do not have a contract with the company. By dumping debris into rivers, streams, ditches, canals, bays, roadsides, forest edges, vacant lands and burning. In Vientiane, the waste generation is 500-600 tons/day, but can be collected and transported to the landfill is only 300-350 tons/day.

**Table 8. Amount of waste generation (Domestic waste) during 2005-2020**

No.	Location	Population 2005 (People)	Population 2015 (People)	Waste generates 2005 (Ton/Year)	Waste generates 2015 (Ton/Year)	Waste generates Assessment 2020 (Ton/Year)
1	City Area	1.523.557	2.135.943	361.464	506.752	617.119
2	Remote Area with road access	2.895.321	3.843.399	528.396	701.420	824.032
3	Remote Area without road access	1.197.482	512.886	131.124	56.161	41.841
<b>Total</b>		5.621.982	6.492.228	1.020.984	1.264.334	1.482.992

**Table 9. Amount of waste generate from hospitals**

Infectious Waste in the country								
Year	2010	2011	2012	2013	2014	2015	2016	2017
Amount of infection waste (Kg)	162.943	169.843	172.722	267.709	198.746	202.967	234.374	189.430

#### 4.4.4 Land use

As noted in Section 4.1.1, forest cover has declined significantly. The vast conversion of land in Lao PDR to different uses has been driven directly by expansion of agricultural lands, road construction, hydropower construction and mining and is strongly rooted on population growth; economic growth demanding energy, and agricultural and non-agricultural resources; increasing FDI; and land tenure and other related policies (Lefroy, Collet, & Grovermann, 2010).

#### 4.4.5 Water availability and quality

It is estimated that surface and groundwater flows from Lao watersheds, including vast areas of land with low productivity, contribute 35% of the total average flow of the Mekong River, with 80% of these flows supplied during the wet season. The Mekong is the main river of the country, with a total distance of 1,860 km flowing from north to south, forming a long border with Thailand. Laos is estimated to take up 25% of Mekong basin, which supplies 270 billion m<sup>3</sup> of fresh water per year nationwide. There are 39 tributaries and sub-tributaries in the Mekong basin in Laos. Water provides the country with resources for irrigation, fisheries, plantations, livestock, and hydropower potential (~ 23,000 MW in capacity), as well as urban and rural water supply. With a huge volume of fresh water, solely 5.7 billion m<sup>3</sup> has been used annually. Water is predominantly used for agriculture (82%), followed by industry (10%), and the rest for household purposes. (<https://laos.opendevelopmentmekong.net/topics/environment-and-natural-resources/>)

Lao PDR has a high potential for renewable energy, especially from its hydropower resources. It is the most important energy resource in the country. The technical potential was estimated at around 26,000 MW. In Lao PDR, hydropower schemes with a capacity below 15 MW are classified as small-scale schemes. Only 10% of the produced electricity is used domestically. The government's energy strategy focuses on renewable energy resource development for the following technologies: biofuels, small-scale hydropower plants, solar, biomass, biogas and wind, and other alternative fuels for transportation. (Chapter 8 Sustainable Consumption and Production in Lao PDR, [www.worldscientific.com](http://www.worldscientific.com))

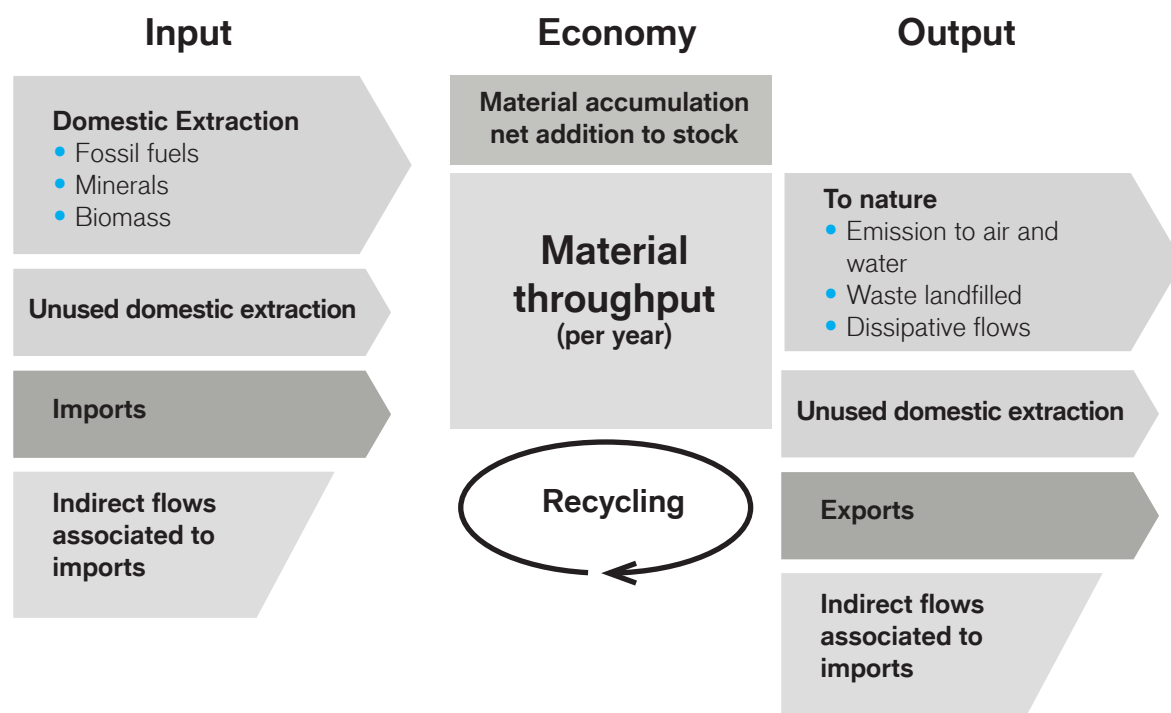
## 4.5 Resource use intensity

The CSIRO and UNEP study in 2010 calculates for materials, energy and water intensity of Asia Pacific countries (APRSCP and SWITCH-Asia RPAC, 2021).

Lao PDR is now gearing itself towards a higher level of development and with this development is the expected accelerated resource use that will fuel a more rapid urbanization, infrastructure development, and satisfaction of emerging new consumers.

The need to look into the country's resource use pattern and efficiency has become more important considering that natural resources and manufacturing sectors are expected to be the drivers of the country's growth drive growth. European Union's relaxation of raw materials sourcing requirements opened strong production for garment produces in the country. Increase in transportation facilities and infrastructure, hotels, and restaurants – all are resource use intensive – is also expected. Agriculture (fishery, livestock and crops) is expected to benefit from the recent increase in regional demand and higher food prices. Out of 8.6% growth in 2011, about 3.6 percentage points come from the resource sectors, about 1 percentage point each from manufacturing and agriculture, 0.5 percentage points from construction and 2.5 percentage points from services.

Using the Material Flow Accounting and Analysis (MFA), this portion of the paper seeks to view the interrelation between Lao's economy and its environment, in which "the economy is an embedded subsystem of the environment and – similar to living things – dependent on a constant throughput of materials and energy (Eurostat, 2001). It is a system where raw materials, including water and air, are extracted from the natural system as inputs and then transformed into products to be used by the people and then finally released or re-transferred to the natural system as outputs in the form of waste or emissions.



**Figure 4 : General scheme for economy-wide material flow accounting**

*Source: Eurostat 2001*

For MFA in Laos, two main boundaries of resource flows are considered. The first is the boundary between the country's economy and its domestic natural environment from which all the resources for its growth are extracted. The second is its boundary with other economies characterized by its imports and exports.

This discussion paper basically used Heinz Schandl's category breakdown: Biomass, Fossil Energy Carriers, Metal Ores, Industrial Minerals and Construction Minerals. Unfortunately, sources available on Lao's economic activities still lack significant inputs on some indicators. Sources like the CIA World Fact Sheet 2011, CSIRO and UNEP Asia-Pacific Material Flows online database, and World Bank Database contain incomplete information on certain period of time. Some figures on Domestic Extraction and Consumption were estimated based on growth rate observed during several years of data availability. Figures on construction materials are also wanting.

Biomass flows were expressed as for sub-categories: primary crops, crop residues, grazed biomass and wood. Metal Ores simply refer to metal production while industrial minerals refer to tonnage of metal ores harvested directly from the land. Grade factors here were not generally applied. Construction materials here include major construction minerals like sand, clay, gravel, crushed rock and similar construction materials (Schandl and West June 2010).

## Current Extraction

In Laos, metal ores and industrial minerals account for the major share of extraction, followed by fossil fuels and then by biomass. Figures on construction materials are in the negative and therefore not reflected in **Figure 5**. Again, figures in available literatures show only data until 2005. The rest of the figures were extrapolated based on consistent growth pattern starting from 1970s until 2005.

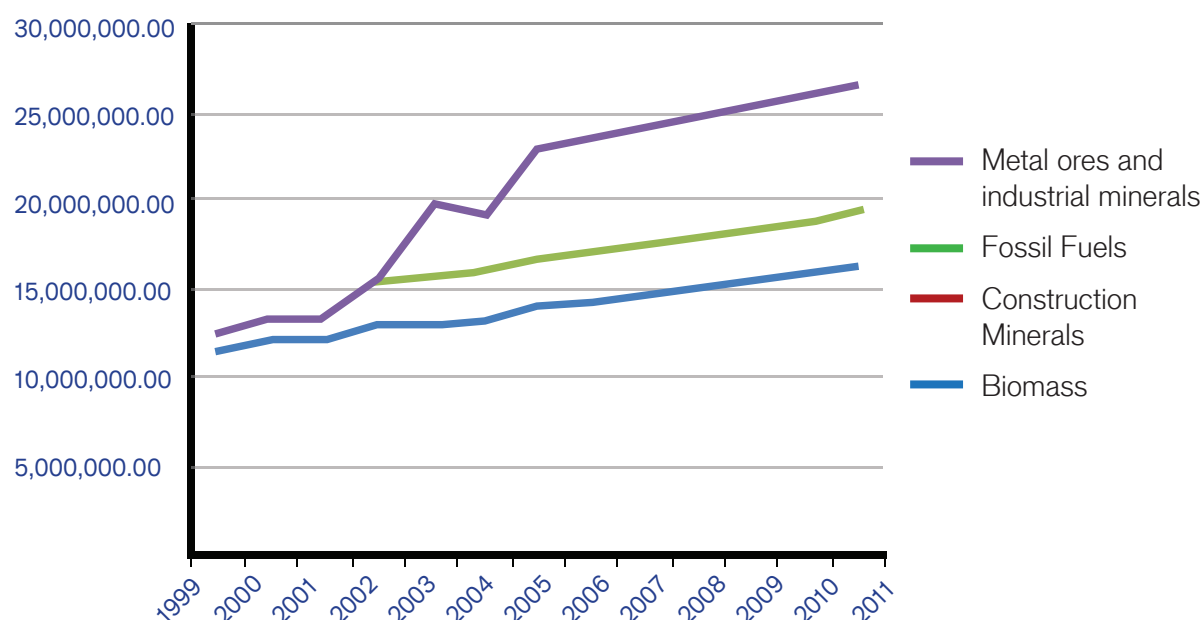


Figure 5: Extraction Trend



## Domestic Material Consumption

Using Schandl's formula, DMC here is computed as  $DMC = \text{production} - \text{exports} + \text{imports}$ . The pattern as shown in figure two closely follows the trend in domestic extraction. It appears that consumption runs parallel with extraction and could mean that Laotian simply consumes what they produce. However, since DMC here also includes those materials that were imported, it would necessitate reading the pattern in the light of the country's Gross Domestic Production.

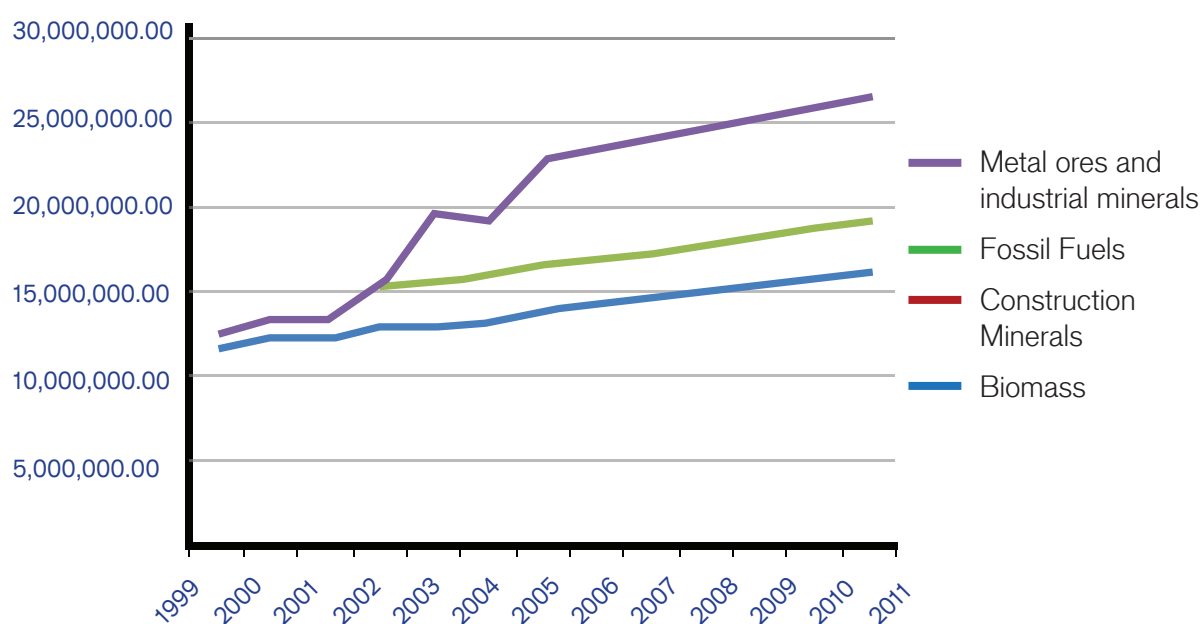


Figure 6: Domestic Material Consumption Pattern

## Lao GDP and GNI situation

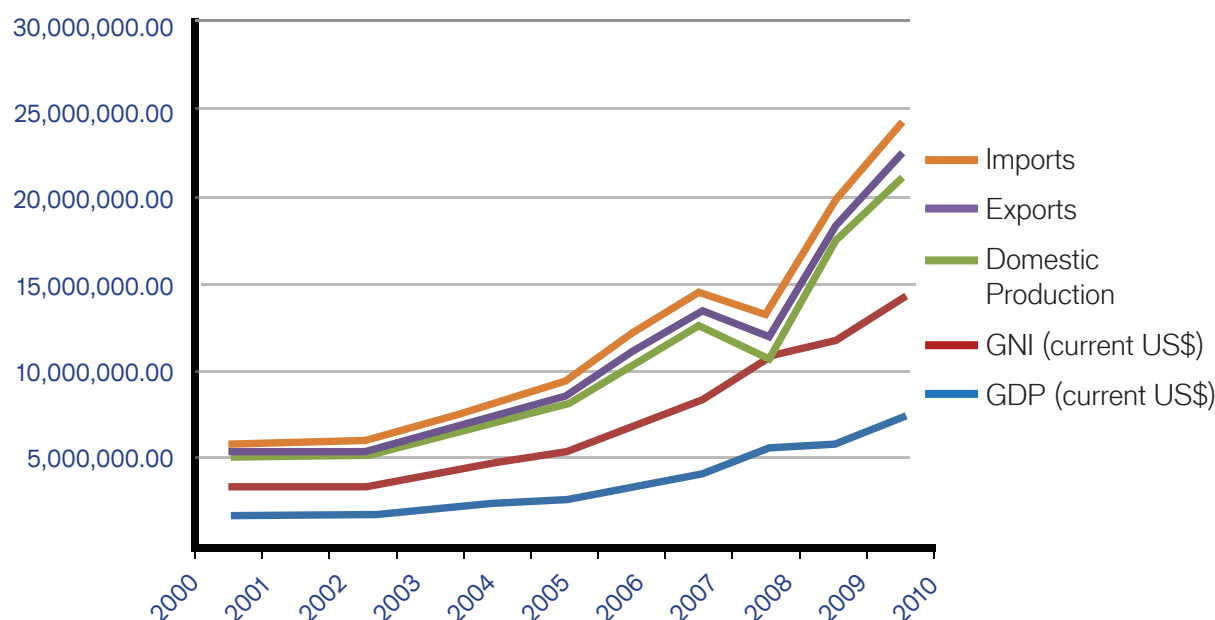
Wikipedia defines Gross National Income (GNI) as consisting of “personal consumption expenditures, the gross private investment, the government consumption expenditures, the net income from assets abroad (net income receipts), and the gross exports of goods and services, after deducting two components: the gross imports of goods and services, and the indirect business taxes. The GNI is similar to the gross national product (GNP), except that in measuring the GNP one does not deduct the indirect business taxes.”

Both GNI and GDP enjoyed a growth rate of 12.75 and 9.4 respectively in 2010. The trend has been keeping its positive trend since 2000 and is expected to continue and even improve considering the current economic conditions and policy climate of the country.

This, however, must be taken with a grain of salt in the light of the country's current resource use pattern. Based on **Figure 7**, starting in year 2000, there has already been a growing divide between DMC, DE and the country's GNI and GDP. While GNI and GDP continue an upward positive trend, DMC and DE is keeping a safe distance above the two economic indicators. Gaps in terms of data may explain the disparity but it must be remembered is that the data available still lacks significant input on some important indicators. This could mean that the disparity could widen when and if the data are completed.

Lao PDR's export of volume of 469.26 (based on 2000=100 Export Value Index) in 2010 is easily negated by its import volume of 208.78 (based on 2000=100 Export Value Index) in the same year. This means the government spent USD 1,800,000,000.00 for its imports while generating

an income of USD 1,600,000,000.00 from its exports. Over the same year, Lao PDR spent USD 6,572,698,212.82 of its own resources to produce the goods and services required to meet the needs of its people. With the figures presented, there seems to be a deficit in terms of resources spent to generate the goods and resources against the government earnings generated in 2010. Perhaps, when figures are completed, this will somehow be properly explained.



**Figure 7: Lao GNI and GDP against Domestic Extraction, Exports, and Imports**

On the emissions, it must also be noted that in year 2010, the following were reported in Schandl's paper:

Carbon Dioxide Emissions	2005	2006	2007	2008
CO2 emissions (kg per 2000 US\$ of GDP)	0.61	0.60	0.56	0.52
CO2 emissions (kt)	1,426.46	1,518.14	1,536.47	1,532.81
CO2 emissions from liquid fuel consumption (kt)	407.04	407.04	421.71	429.04
CO2 emissions from liquid fuel consumption (% of total)	28.53	26.81	27.45	27.99
CO2 emissions (metric tons per capita)	0.25	0.26	0.26	0.25
CO2 emissions (kg per PPP \$ of GDP)	0.15	0.14	0.13	0.12
CO2 emissions (kg per 2005 PPP \$ of GDP)	0.15	0.14	0.14	0.13
CO2 emissions from solid fuel consumption (kt)	898.42	913.08	916.75	905.75
CO2 emissions from solid fuel consumption (% of total)	62.98	60.14	59.67	59.09

Source: CSIRO and UNEP Asia-Pacific Material Flows online database

It must be noted that data presented in the above table are only up to 2008. While updated figures are still lacking, it can be observed there is no significant movement or trend to see the impact of Laos' economic development on its emissions from fuel consumption. A careful note, however, must be taken to ensure appropriate attribution of the figures considering the small urban centers of Laos against its rural counterparts.

## Resource Use Efficiency

While it is true that data supporting a proper analysis of Lao PDR's DMC and its resource use in general is still wanting, it can be observed that the domestic material consumption in the country is steadily growing from 12,517,632 million tonnage in 2000 to an estimated 26,530,618.13 million tonnage in 2011 for an estimated average annual growth rate of 2.56. This growth runs parallel to the country's population change rate of 2% per annum. If however, the government wants to make its resource use more efficient, there might be a need for the government to look at its current domestic extraction and production and employ appropriate technology to maximize their benefits or make it at par with the current GDP and GNI.

The increasing trend in GDP and GNI increases Laotian's Purchasing Power Parities (PPP) that may then increase resource use or demand for new resources in the coming years. There is also a need to review Lao's resource use against resource use of other countries in the Mekong Region so as to approximate its contribution to the understanding of material flows in that region and its impact on other stressors like climate change.

What the Laos government may want to look into are options or potential strategies to reverse the trend of its material intensity (MI) to reflect a declining trend. Schandl reported that "having MI decline overtime is an indication of 'doing more with less' and is a pre-requisite for achieving continued growth without placing ever heavier demands on the environment."

## 4.6 Forecasts for resource use

Energy demand is forecasted to increase by 1,006 GWh per year within 2007 to 2020 which translates to an energy demand of 1,400 GWh in 2007 to 14,784 GWh in 2020 (Ministry of Energy and Mines, 2008) gives the energy demand forecasted for 2010, 2015 and 2020.

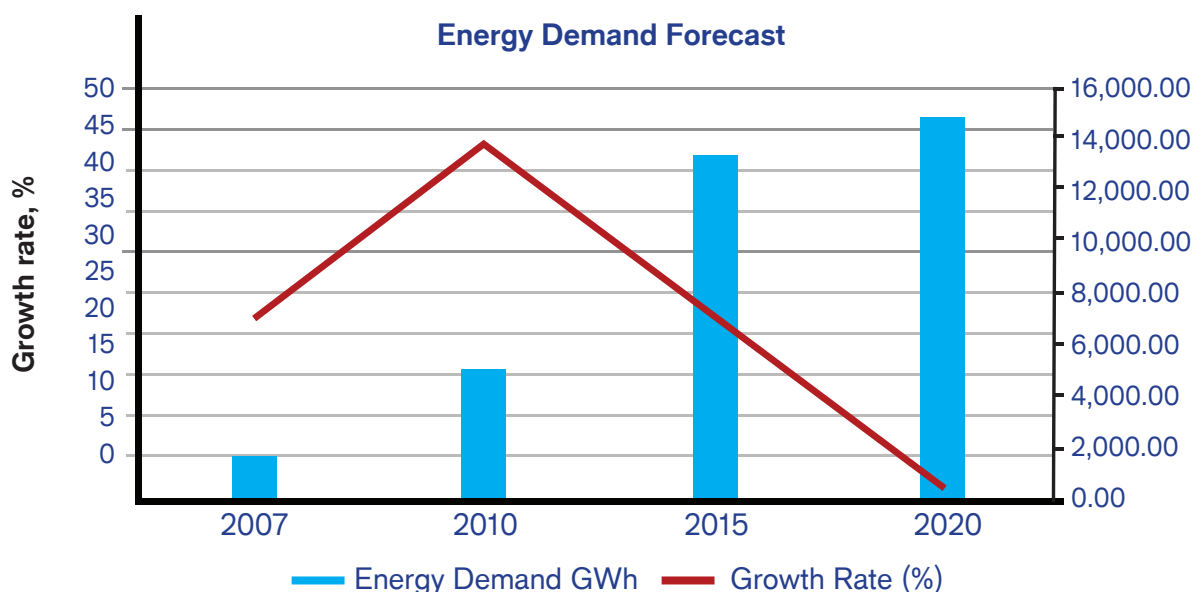


Figure 8: Energy demand forecast based on 2006 demand

## 5. Recommendations of ways forward to National Green Economy Policy

Considering that the economic growth of Lao PDR has relied on the industry sector in recent years, and the development path favors the continued promotion of hydropower and mining in a sustainable manner, a number of opportunities open up for the country in light of green economy.

### a. Identification of criteria for Green Economy and desired outcomes

Given the status of resource utilization and socioeconomic background of the country, a clear understanding of what the concept of Green Economy signifies to Lao PDR emerges. Socioeconomic conditions indicate that despite the strong economic growth of the country, there is high income inequality among the population which is mostly employed in agriculture sector. An important implication of this would point to the fact that the environment directly provides services to sustain the needs of a significant fraction of the population. As reliance on ecosystem services continues, there is a need to maintain resource stock not only for direct consumption, but also as a raw material for industrial use which appears to be gaining momentum in terms of investments.

On the other hand, the steadily increasing domestic material consumption provides an insight on the development of the country. The high GDP growth is necessitating the intense use of finite resources. As the country pushes for modernization and industrialization, it is important to look at the efficiency of resource use and the release of pollution. Producing more and polluting less will be important criteria for the development of industrial zones in accordance to the development plan of Lao PDR. Technical needs analysis can be accomplished to reflect the pressing requirements for improvement in the delivery of the same products and services while utilizing less raw materials and generating less waste.

Another consideration would be to mainstream SCP in the context of climate change strategies. It appears to be a necessity for the country which relies on hydropower. Climatic changes should be a consideration in designing development of more dams and related structures to ensure proper placement. Mainstreaming climate change in every aspect of development policy should be initiated through strengthening inter-agency cooperation and coordination. SCP indicators and criteria should also align with the long term economic plan of the Ministry of Planning and Investment in order for budget to be allotted for the enforcement of ENR management and protection policies.

### b. Capacity building and technical assistance

The lack of data in the current work such as the hidden flows and other MFA data requirements appears to be a barrier for a more comprehensive assessment (Section 3.4). By putting MFA data collection in place, better information can be guaranteed to assess resource use efficiency in the future. Both UNESCAP and UNEP IETC have spearheaded data gathering of EST and indigenous technology documentation. Knowledge-sharing not only in this aspect could benefit the country.

Lao PDR can benefit immensely from partnerships through scientific data sharing, South-South collaboration, indigenous resource R&D, and other measures in order to acquire the benefits of disseminating and operationalizing their strategic initiatives.

UNIDO has also initiated the RECP global knowledge hub for green industry in search for sectoral performance benchmarking, and this is to be coordinated by the MONRE and MST.

### **c. Data collection and development of database of indicators and best practices for greening the economy**

To be able to implement Green Economy measures, there is a need to identify existing conditions and subsequent monitoring of these to allow for timely and appropriate interventions. Furthermore, clear sustainability targets with indicators (e.g., resource use intensity, emissions, green public procurement) should be identified at both at the national and local levels. Enforced with models and examples, these targets should be properly communicated and identified to the stakeholders. Relevant programs of Ministries and Departments should identify the SCP key success factors (KSF) through benchmarking with Asia Pacific regional neighbors. A knowledge-bank initiated by DOST, DTI and DENR can enhance the access of industries to the best practices. Global SCP framework and international platform should be utilized and adopted to serve the local needs.

### **d. Technological modernization and skills training for sustainable energy, responsible mining and poverty alleviation**

Investments in the industry sector show no signs of slowing down as the hydropower continue to realize energy security and sustain economic development of the country. This implies that land use would greatly be affected by the large areas that will be required in developing hydropower sources to be able to supply the demand of economic and social activities. Hence, it will be sensible to invest in enhancing local labor to be able to match the skills required of green jobs arising from the renewable energy sector as the country has potential for biomass and solar energy. Providing the labor force with necessary skills could balance the low employment in the industry sector which is receiving the most investments.

For Lao PDR to benefit from mining, environmental safeguards and standards must be developed and strictly enforced to ensure environmental protection. Studies as to where mining permits may be granted should be thoroughly made considering the rich biodiversity and inland water resources of the country. In addition, investing in technology and labor training for mineral and metals to be processed locally could be a viable option in the future to lessen dependency on imports. However, mineral millings would be an additional pollution burden to the country; therefore pollution control through adoption of best available technology can lessen the risk of water pollution.



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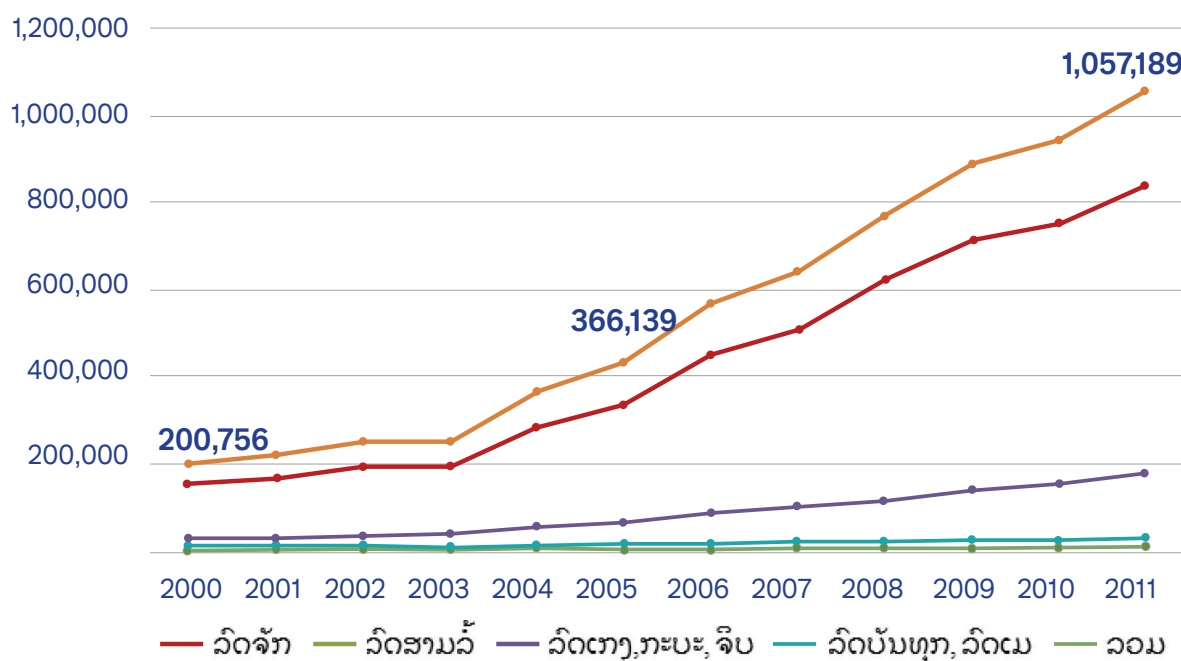


## 7. APPENDIX 1

Mineral reserves in Lao PDR

Mineral	Estimated Reserve	Unit
Coal	512,603,073	tons
Gold	2,775,749	oz
Iron	57,666,420	tons
Marcasite/ Pyrite	474,781,000	tons
Tin	9,900,000	tons
Gypsum	47,705,900	tons
Clay	70,621,436	tons
Glass sand	7,989,239	tons
Potash salt	50,334	million tons
Sapphire	5,238,941	cts
Limestone	2,205,796,920	tons
Marble	2,205,796,920	tons
Barite	65,608	tons
Lead/ Zinc	23,000	tons
Manganese	310,819	tons

Number of vehicles in Lao PDR, 2000-2011



## 8. APPENDIX 2- POLICIES, STRATEGIES, PLANS, NETWORKS (GOVERNMENT, CIVIL SOCIETY, PRIVATE SECTOR)

- The National Green Growth Strategy of Lao PDR is in the consultation phase and will aim to guide the country's response to SCP. As Lao PDR moves forward with the National Socio-Economic Development Plan (NSED) and sectoral strategies, collaboration and coordination across line ministries as well as between central and local authorities will be essential for interventions to reach to the whole population, mainly the poorest communities. (Lao's VNR 2019)
- The 2006–2020 Lao Tourism Strategy is a master plan document to define policy, guidelines, and the overall goal of the development and promotion of tourism which will be in line with the party congress resolution, national socio-economic plan and strategy in order to strengthen and develop tourism to become an industrial sector that generates foreign exchange revenue for the country. Sustainable development of tourism destinations is mentioned together with the objectives of providing more employment, promoting cultural conservation and preservation of the nation's good norms and customs, including the protection of abundant natural resources, promotion of local products in order to contribute to poverty reduction of all ethnic groups. (Chapter 8 Sustainable Consumption and Production in Lao PDR, [www.worldscientific.com](http://www.worldscientific.com))
- Lao PDR intended Mitigation Activities to be implemented in 2015-2030 presented in **Table 1.1**

**Table 1.1 Intended Mitigation Activities to be implemented by Lao PDR in 2015-2030**

No	Name of activity	Objectives of the activity	Estimated CO <sub>2</sub> e reductions
1	<b>Implementation of “Forestry Strategy to the year 2020” of the Lao PDR</b>	To increase forest cover to 70% of land area (i.e. to 16.58 million hectares) by 2020. Once the target is achieved, emission reductions will carry on beyond 2020.	60,000 to 69,000 ktCO <sub>2</sub> e (once the target has been met, by 2020 onwards)
2	<b>Implementation of Renewable Energy Development Strategy</b>	To increase the share of renewable energy to 30% of energy consumption by 2025. (Note that large scale technologies with installed capacity equal to or greater than 15MW are not included in this policy's target.) For transport fuels the objective is to increase the share of biofuels to meet 10% of the demand for transport fuels by 2025.	1,468,000 ktCO <sub>2</sub> e (by 2025).
3	<b>Implementation of Rural Electrification Programme</b>	To make electricity available to 90% of households in rural area by the year 2020. This will offset the combustion of fossil fuels to produce power where there is no access to the electricity grid.	63 ktCO <sub>2</sub> /pa (once the target has been met in 2020)

No	Name of activity	Objectives of the activity	Estimated CO <sub>2</sub> e reductions
4	<b>Implementation of transport focused NAMAs</b>	In one NAMA feasibility study, road network development is identified as a first objective which will reduce the number of kilometres travelled by all vehicles. The second objective is to increase the use of public transport compared to the business as usual (BAU). In addition to a reduction in GHG emissions the activity will lead to a reduction in NOX and SOx emissions which will have significant co-benefits such as improvement in air quality which in turn will have positive impacts on human health.	Road network development is 33 ktCO <sub>2</sub> /pa, and 158 ktCO <sub>2</sub> /pa for public transport development
5	<b>Expansion of the use of large scale hydroelectricity</b>	The objective of this activity is to build largescale (>15 MW) hydropower plants to provide clean electricity to neighbouring countries. Approximately total installed capacity of the hydropower plants will be 5,500 MW by 2020. In addition, 20,000 MW of additional hydroelectric capacity is planned for construction after 2020.	16,284 ktCO <sub>2</sub> per annum (2020-30)
6	<b>Implementation of climate change action plans</b>	To build capacity to monitor and evaluate policy implementation success, with a view to producing new policy, guidance and data. The objective is to develop and implement effective, efficient and economically viable climate change mitigation and adaptation measures.	To be estimated as part of the implementation plan

(Intended Nationally Determined Contribution, 2015)

## 1. Programs and projects (government, civil society, private sector)

**SWITCH-Asia projects in Laos** (Chapter 8 Sustainable Consumption and Production in Lao PDR, [www.worldscientific.com](http://www.worldscientific.com)):

- ASEAN Energy Manager Accreditation Scheme (AEMAS) (2010-2014): Established EMAS National Councils in Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam with a total membership of 74 organisations. Lao PDR and Cambodia memberships are under preparation. Brought about a total reduction in CO<sub>2</sub> emissions of up to 55,000 tonnes.
- ICS Programme Laos PDR (2013-2017): The project aims at introducing cleaner and fuel-efficient ICS by the end of 2016, aiming for 50% of the market share of cook stoves.
- Eat Greener —Changing Food Consumption Patterns: A Sustainable Approach towards Economic Development in Lao PDR (2014-2015): The Project sought to boost national, ASEAN and European consumption of Lao sustainable food products (organic rice, tea, etc.). Increased demand for Lao greener processed food products will increase their market share and have a positive impact throughout the value chain stakeholders in a sector with high poverty alleviation potential.
- Promotion and deployment of energy efficient air conditioners in ASEAN (2013-2016): The project aims at increasing the market share of higher efficient ACs in ASEAN through harmonisation of test methods and EE standards, adoption of common Minimum Energy

Performance Standards (MEPS), and changing consumer purchasing attitudes in favour of energy-efficient ACs.

- Sustainable Product Innovation in Vietnam, Cambodia, and Laos (SPIN-VCL) (2010-2014): The project set up a sustainable product innovation network to improve innovative power of industry, and improve environmental and societal quality of products made in Vietnam, Cambodia, and Laos. Activities included marketing skill training sessions for SMEs, marketing access via fairs and product catalogues.
- Sustainable Rattan Industries (2009-2011): This project supported the sustainable rattan industry by introducing CP, a credible chain-of custody certification and by establishing links to European and other international markets, thereby delivering a measurable improvement of the sector's environmental performance. Direct results include 22,000 villagers increased their income by 5–45%; the world's first FSC certified rattan and 19,000 ha under responsible forest management 220 SMEs were introduced to CP.

### United Nations Environment Programme (UN Environment)

- Sustainable Consumption and Production (SCP) Course Outline for National University of Laos (2017) As part of the Small Scale Funding & Agreement (SSFA) between United Nations Environment Programme (UNEP) and TERI University, an SCP curriculum has been developed for the undergraduates at National University of Laos. The methodological approach followed for developing the course outline includes review of literature and relevant documents from UNEP, SWITCH Asia, World Bank, ADB, OECD, and GIZ that were specific to SCP, related course outlines from distinguished universities and learning platforms such as University of Queensland and UNEP E-Learning Course, presentation on “The role of education in realizing more Sustainable Consumption and Production (SCP) patterns and the development of a national SCP curriculum” during the Inception mini-workshop held on 4th October 2017 and inputs from technical sessions and formal/informal discussion held during the ToT.

### Others

- Energy Efficiency Program (Sustainable Consumption and Production Baseline Research for ASEAN, 2019):
  - Laos is still developing an energy efficiency standard and labelling program with the help of other Asian countries such as Japan and Thailand. Laos has no manufacturing capability for electrical and electronic products, including lighting products and imports these products from neighbouring countries such as Thailand, China and Vietnam. Facing energy shortage due to rapid economic growth, Laos is taking a key step to tackle the energy supply shortage through demand-side management. The residential sector is a major energy consumer in Laos, and in 2015, it made up 40.2% of the country's energy consumption. High energy consumption is mainly due to the usage of low energy efficient electric appliances. The Electricite du Laos (EdL), a state-own utility, is implementing the Demand-Side Management and Energy Efficiency (DSM/EE) Phase II project with financial support from the World Bank and contracting the International Institute of Energy Conservation (IIEC) as the project consultant.
  - In August 2018, a workshop was held in Vientiane with several Laos ministries as well as ACE to discuss the improvement of the standard and labelling (S&L) system proposal (air conditioner-related), creation of the draft of regulations, and preparation of the S&L operation system. As of 2019, nothing has been announced yet.

- Recycling Program (Sustainable Consumption and Production Baseline Research for ASEAN, 2019):
  - Enacted in 2012, the Environmental Protection Law (EPL) No 29/NA is the basic law on environmental protection and states that general waste should be separated to allow reuse and recycling. There are no other policies and regulations that support waste-to resource approaches or the principles of 3Rs. The Ministry of Natural Resources and Environment (MoNRE) and the Ministry of Public Works and Transport (MPWT) oversee solid waste management and recycling in Laos, while the main responsibilities are delegated to provincial authorities and district offices. At the provincial level, the national ministries have more of a regulatory, supervisory and supporting role, as the Urban Development Administrative Authorities (UDDAs) oversee solid waste management issues. At the local level in capital city, the Vientiane City Office for Management and Service (VCOMS) is responsible.
  - There are no official statistics for national recycling rates but in 2011, a survey conducted in Vientiane found an 8.7% recycling rate. The informal waste management sector has both informal and formal stakeholders. The informal sector consists of waste pickers, scavengers and VCOMS workers who collect and sell recyclables while working within the premises of waste collection and transfer facilities and landfills. Waste pickers and scavengers often collect recyclables from source and sell them on the same day to buying centres. And because, just like India and other developing countries, the waste pickers are not part of the formalized economy, they are usually deprived of the mechanisms that protect them from world market fluctuations or declining prices. That makes them very vulnerable to exploitation. The VCOMS workers, who collect recyclables from mixed waste, recover soiled plastics which sell for a lesser cost than clear and clean plastics.
  - The formal sector includes recycling buying centres, recycling workshops and processing companies, which are legally licensed to operate and conduct profit-driven activities with recyclables. Recyclables sold to buying centres are either processed by local small and medium enterprises that carry out some sort of processing/treatment of recyclables or exported to neighbouring countries for final processing or treatment, in particular China and Vietnam. While these enterprises can churn out raw materials for other industries, the manufacturing processes of these companies tend to be relatively simple and rudimentary, and thus adding limited value to the recyclables value chain.

## 2. SDG12 reporting/monitoring and evaluation

- The efficient use and sustainable management of natural resources and the development of ecotourism are prioritized through the NSEDP. Nowadays, Lao PDR is still developing system and framework to assess progress toward SDG 12. (Lao PDR' VNR 2019)
- Intended Nationally Determined Contribution (NDC) 2015: Lao PDR is committed to the implementation of its National Strategy on Climate Change (NSCC) and its sectoral climate change action plans, for the national, regional and global benefit. The INDC will be implemented in a coordinated manner with the NCCS, climate change action plans and the sectoral plans. The current climate change action plans run until 2020 and Lao PDR will start devising the next set of action plans to continue to implement the NCCS before the end of the year 2020. The Intended Mitigation Activities to be implemented by Lao PDR in 2015-2030. (NDC, 2015).

### 3. Key sectors or priorities

- The efficient use and sustainable management of natural resources, including sustainable land management, has been identified as a priority for Lao PDR and is a cross-cutting issue linked to biomass and livestock power generation, food and agriculture processing, energy and other sectors that are resource-dependent and contribute to Lao PDR's GDP growth. Inadequate use and management of these resources may exacerbate social and economic inequalities, thus slowing progress on sustainable development.
- Ecotourism has been defined as a national priority in the Eighth NSEDP. It is part of at least two Green Growth indicators while SWITCH-Asia currently has one grant project operating in this high-impact and rapidly growing area.
- Sustainable Public Procurement (SPP) and Eco-labelling tools are needed to improve supply chain management and consumer decisions, in particular with regard to resource efficient SMEs in textiles and garment sectors.
- Waste management, specifically with regard to including food, plastics and pollution control, is another cross-cutting issue that overlap with the same sectors affected by sustainable natural resource management, including at the individual/household level.
- The forestry industry, and in particular timber processing, is set to become an increasingly important sector in Lao PDR. The development of this industry should promote efficiencies in the in terms of inputs/output flows and of the sustainable management of timber resources.

*(Source: Country Profile Lao PDR, Switch Asia SCP Facility)*

### 4. Challenges (readiness/mandate, financing, capacity, data etc. monitoring and evaluation, stakeholders)

- Measurement of progress is difficult as most targets under SDG 12 lack robust measurement systems, especially those that can be implemented locally.
- Existing policy frameworks are not fully aligned with SCP, while the National Green Growth Strategy is still being developed.
- While Lao PDR has done substantial efforts to localised SDGs, the awareness of policymakers and public understanding of the SDGs is weak, in particular SDG 12, and their relationship to the long-term development of the country.
- Small and Medium Enterprises (SMEs) and Government entities lack sufficient access to the best available technologies, environmental practices and innovations.
- Insufficient financing raises the risk of inefficient and ineffective sustainable development strategies and activities.

*(Source: Country Profile Lao PDR, Switch Asia SCP Facility)*



## 5. Opportunities/Potential

### SDG 12 opportunities from VNR 2019:

- The national policy framework on sustainable consumption and production should fit with existing frameworks. To this end, MoNRE is in the process of identifying Green Procurement guidelines and indicators that will fit into the Lao context.
- SMEs will need to develop their human resources and skills, while Government entities and SMEs will need access to the best available technologies and environmental practices, innovations and marketing tools.

### SDG 12 opportunities from Switch Asia Country Profile:

- Pursuing innovative finance, including introducing government to hybrid business models e.g. subsidised service delivery by entrepreneurs; Public-private Partnership can help bridge the gap for decentralised systems, e.g. those used for small-scale energy and safe drinking water.
- Enhanced integration of SCP into government agendas is both important and possible with numerous supporting mechanisms available to aid building of coordination bodies. Engaging with regional green growth initiatives such as those by ASEAN or the Asian Development Bank can also provide resources to support these activities.
- Education and training activities can support both general and technical capacity needs around SCP, tailored to support different audiences such as rural residents, SMEs and policy makers; multi-stakeholder engagement can help identify the most effective platforms.
- The upcoming launch of the Green Growth Strategy and its subsequent rollout at sector level present good opportunities for stimulating line ministries to uptake SCP policies.
- Expansion of labelling and standards will not only improve safety but also resource efficiency, particularly with regard to energy, which is crucial as Lao PDR's energy needs continue to grow with its economy.

## 6. Case Studies

### 6.1 SWITCH-Asia Case Study: Sustainable Rattan Project (Chapter 8 Sustainable Consumption and Production in Lao PDR, [www.worldscientific.com](http://www.worldscientific.com))

6.2 The first phase of Sustainable Rattan project was implemented by WWF Laos in partnership with local communities and national stakeholders, such as Lao National Agriculture and Forest Research Institute (NAFRI), Lao Forest Research Centre, Department of Forestry, Ministry of Commerce and Industry, and Faculty of Forestry at Lao National University, with donor support from IKEA, a global furniture company. Phase I was a three year project (2006–2008) that implemented a sustainable rattan harvest and production model in the Vientiane and Bolikhamxay provinces to support local livelihoods, conserve nature, and capitalise on the rapidly growing rattan export market by establishing full-scale production and manufacture of rattan products within the country. The second phase of the project which focused on cleaner production and sustainable rattan harvesting was co-funded by the EU SWITCH-Asia Programme, titled “Establishing the sustainable production system for rattan products in Vietnam, Laos, and Cambodia.” Overall, the project strengthened small- to medium-sized rattan enterprises by improving the processing and supply chain, including the introduction of certification, and implemented and enforced national and regional policy to support sustainable rattan management, marketing and regional/international trade.

Results achieved by the SWITCH-Asia project “Sustainable Rattan”:

- Systematic involvement and training of all actors along the rattan supply chain, from village producer groups to buyers.
- 12 contracts with international retailers were signed and 46 were drawn up after the project completed.
- 22,000 villagers increased their income by 5–45%.
- The world's first FSC certified rattan plantations of 19,000 ha were under responsible forest management.
- 220 SMEs were introduced to CP practices.
- Policies were reviewed and piloted to support community-based rattan processing and to promote a green rattan industry.
- 38 SMEs started to amend their production systems taking into consideration environmental and social standards.
- 5,774 households (rattan pre-processors) improved rattan production skills.

### 6.3 SWITCH-Asia Case Study: ICS Project (Chapter 8 Sustainable Consumption and Production in Lao PDR, [www.worldscientific.com](http://www.worldscientific.com))

As in many countries, the fuel mix used in Lao kitchens consists of a variety of sources primarily comprised of biomass, wood, and charcoal. Charcoal prevails in 88% of kitchens in the intervention area, with an average monthly consumption of 40 kg, for some 10 USD/month. Wood is used in 48% of households and, with a large variation, this is in the range of 150 kg/month. Wood is normally collected rather than purchased, a task that requires 13.5–16 hours per month. Availability and affordability of wood and charcoal are highly variable. Charcoal is the preferred fuel for several speciality meals, and is therefore used regardless of the availability of clean cooking options, even in higher-end households.

Over the last decades, there have been attempts to design new, energy efficient cook stoves in Lao PDR with some success. One such is the ICS project, carried out by Oxfam Novib in close collaboration with SNV Netherlands Development Organisation and a local NGO, NORMAI in 2013 with funding from the EU SWITCH-Asia Programme and Blue Moon. The project is actually a continuation of an initiative started in 2010, to support further ICS uptake. The ICS project is one of the few initiatives in the Mekong sub-region that aims at mass dissemination of ICS, while contributing towards poverty alleviation in Lao PDR through the development of a SCP chain of fuel-efficient cook stoves. The ICS also reduces the use of wood and charcoal and lower greenhouse gas emissions.

**The ICS project's key objectives for 2013–2017 include:**

1. 15 producers sustainably produce 100,000 ICS.
2. 150 SME retailers successfully promote the ICS.
3. Lao Women's Union assumes its role as promotional partner.
4. Five testing agencies are operational.
5. A national standard of stoves is endorsed.
6. Establishment of a multi-stakeholder partnership.

**Achievements as per December 2014 are as follows:**

1. 16 producers are actively producing ICS.
2. 375 retailers are selling ICS in their local shops.
3. The Lao Women Union conducted 26 demonstration workshops.
4. The Ministry of Science and Technology operates three test labs.
5. National standards are under preparation.
6. Multi-stakeholder meetings conducted twice a year.

The improved cook stove was tested for its EE and offered to project staff and officers from the Ministry of Science and Technology. Three test labs across the country are now operating; the tests evaluated fuel savings realised by ICS compared to various stoves commonly seen on the market. The version of 'Tao Payat' improved cook stove has the potential to save 18–39% fuel. Apart from the economic benefit, the social benefit, which is sometimes hard to quantify, is better indoor air quality resulting in housewives' health improvement due to less smoke, while ICS also creates jobs for villagers, producers, and traders who are working in charcoal production supply chains. Further benefits are the energy saving potentials, which can be quantified in terms of greenhouse gas emission reduction.

## 9. APPENDIX 3-SCP NATIONAL ROADMAP DEVELOPMENT

### Introduction

Currently, as a result which SCP has consolidated into the 9th NSEDP, transforming SCP work to concrete programmes, projects, activities and etc. without duplication between stakeholders as well as the public and private agency is essential and ensuring the unity and effectiveness of SCP policy transformation and implementation along the 9th NSEDP, National Green Growth Strategy and relevant Ministerial Strategies, it is urgently that SCP National Road Map of Lao PDR is needed to be developed.

Department of Planning and Finance, Ministry of Natural Resources and Environment as the National Focal Point has coordinated with SWITCH Asia Regional Policy Advocacy supported by EU Delegation through UNEP Regional Office in Bangkok had signed the Small Scale Funding Agreement (SSFA) aiming to contribute Lao PDR to develop the SCP Road Map by the end of 2021.

### Implementation Plan

**Activity 1: Co-organize number of national and multi-stakeholder workshops and consultations as agreed to discuss and finalize contents of the Lao PDR's SCP Roadmap and the Scoping study**

Workshops and consultations with multi-stakeholders will be organized to (i) inform governmental policy-makers, professionals, and other stakeholders of SCP ; (ii) consult with national and international experts on draft scoping study and the SCP Roadmap for comments, finalization and endorsement; (iii) build consensus on joint SCP roadmap among stakeholders; (iv) promote partnerships between stakeholders, especially public-private partnership; and (v) raise public awareness on the SCP Roadmap.

### Visibility Plan

- Announcement and invitations by one month before the event
- Follow-up to confirm the speakers and discussants by one month before the event
- Leaflet with agenda on one month before the event
- Press release with the SWITCH-Asia RPAC
- SWITCH-Asia website (event page and resource library) and social media (SWITCH-Asia's Facebook and twitter)

**Activity 2: Develop a scoping study to support the design and formulation of the Lao PDR's SCP Roadmap**

The Scoping Study will focus on for example result of the reviews of ongoing implementation of different sectors mentioned in the SCP Strategic Planning; existing incentives and policy instruments accelerating SCP in Lao PDR, previous and ongoing projects or actions promoting SCP in Lao PDR; identification of existing challenges and opportunity for some potential sectors including recommendation to move forward (prioritization of sectors) in short and long term, and mainstreaming, for approval.

**Activity 3: Formulate and finalize the Lao PDR's SCP Roadmap**

The Lao PDR's SCP Roadmap will be formulated based on the analysis from the Scoping Study and through close consultation with key stakeholders and with full participatory process. The Roadmap should identify the institutional arrangement with clear roles and responsibilities to implement the Roadmap with clear goals and targets to achieve. The Roadmap should indicate strategies and targets by sectors. Additionally, the Roadmap should be alignment/synergised with the existing efforts of other agencies in developing Circular Economy roadmap/policy. Finally monitoring and evaluation mechanism should be discussed in the Roadmap.

**Activity 4: Work closely with the SWITCH Asia RPAC, the SCP Facility and EUD in Lao PDR on mainstreaming process and advocating the findings through outreach activity such as the Official Launch**

Compile key outcomes from the researches/analyses carried out from this SSFA to formulate key messages for different sectors including strong visual languages to communicate the Roadmap and support mainstreaming of SCP process, and to organize an outreach/launch of the Lao PDR's SCP Roadmap.







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