

Chapter 8

Sustainable Consumption and Production in Lao PDR

T. Phonsavath

8.1 Introduction

8.1.1 *Geography*

The Lao People's Democratic Republic (Lao PDR) is a landlocked country in Southeast Asia, bordering with Myanmar and the People's Republic of China in the Northwest, Vietnam in the East, Cambodia in the South, and Thailand in the West, and has an area of 236,800 km². Lao population was estimated to be around 6.8 million in July 2014 [World Bank, 2015a]. 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%) [CIA World Factbook, 2007]. The population consists of 49 ethnic groups, in four main linguistic families, according to preliminary figures given to a symposium on the names of ethnic groups on 13–14 August 2000 [Asia Pacific Parliamentary Forum, 2009]. The main languages are Lao, in the Mon-Khmer language group. The leading religion is Buddhism with 67% adherents. About 85,000 or 1.5% declare themselves as Christians, Muslims, and

Bahai represent less than 1%. Animism was not regarded as a religion and included in “Other” which accounted for about 30.9% of the population. About 80% of the population live in rural areas within 18 provinces.

8.1.2 *Economy*

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. Over the past 27 years, annual per capita gross domestic product (GDP) has fluctuated between USD 1,319.60 in 2011 compared to USD 151.15 in 1988 [The World Bank, 2015b]. The UN data economic indicator shows per capita GDP of USD 1,369 in 2012 and the Lao Statistical Bureau shows the latest per capita GDP of USD 1,628 in 2013.

8.1.3 *Human resource development and gender equality*

Human resource development is a main strategy to achieve a higher standard of living for Lao people and to eradicate poverty, thus is a priority for the Lao government. The government also promotes educational activities, human rights, and gender equality. In 2006, the government announced the National Educational System Reform Strategy 2006–2015. The Lao government has also been committed to gender equality and gender mainstreaming. In May 2000, the Prime Minister’s Office issued a directive on the integration of sex-disaggregated statistics in policy and planning of gender-sensitive development programmes/projects. In 2002, the government established the Lao National Commission for Advancement of Women (NCAW). The government’s commitment to gender equality is also expressed in a number of policy documents, including those on population, health, and human resources [GRID, 2005].

8.1.4 *Human Development Index*

Development progress in the Lao PDR has been recognised by a rise in the country's Human Development Index (HDI). From 2010 to 2011, the HDI improved from 0.520 to 0.524 [UNDP, 2014]. The Lao PDR has seen a 39% rise in its HDI since the first Human Development Report was published in 1990. In 2014, the Lao PDR sits in the medium human development category, ranking 139th out of 187 countries and territories in the world. The average HDI for countries in the medium human development group is 0.614 and 0.703 for countries in East Asia and the Pacific region. The Lao PDR's HDI for 2013 is 0.569, which is an increase from 0.565 in 2012. However, when the value is discounted for inequality, the HDI falls to 0.430, a loss of 24.5%. This is a similar rate of loss to the other countries in the medium human development grouping, but higher than the average for the countries in the region [UNDP, 2014].

8.1.5 *Energy and water consumption*

In the Lao PDR, domestic electricity consumption continues to grow. In 2013, households accounted for 38% of the Lao PDR's total electricity consumption. The public sector accounts for 6% of national electricity use, and has shown rapid growth over the past years [Lao DSM, 2013], whilst the industrial and commercial sectors account for a combined 55% of Lao's electricity demand [RESDALAO, 2005]. In 2010, the total electricity consumption was 2,230,000 MWh/year, equivalent to 39 Watt per capita per hour [Lao DSM, 2013], while the total energy consumption per capita was 110 kg oil equivalent in 2010 and correspondingly the annual carbon dioxide emissions generated per capita were very low at 0.3 metric tonnes per capita [UNdata, 2015].

The water sources in Laos comprise the Mekong tributaries, which contribute 35% to the whole Mekong Basin, supplying 270 billion cubic meters or about 600,000 m³ per person. Only 2% or about 5.7 billion cubic meters is used for agriculture and irrigation, equivalent to approximately 850 m³ per capita, while current demand is only 259 m³ per capita. Water usage is predominantly agricultural at 82%, followed by industrial at 10%, and domestic at 8% [WEPA, 2015].

8.1.6 Sustainability challenges

The Lao PDR faces a challenge to balance its rapid economic growth without causing further environmental damage. 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 CO₂ in 1990 to a net emitter in 2000 [UNDP, 2013]. 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. Since 2000, the Lao Government has issued policies to stop shifting rice cultivation and reverting to previous agricultural practices.

The construction of hydropower dams and the inefficient industrial use of forest resources are further reasons for the decline in forest cover. The biggest challenge facing the Lao PDR is the goal to lift up the country from the list of least developed country by 2020 and to develop in sustainable ways as described in the Millennium Development Goal (MDG) 7 of Laos. State policies and strategies have been issued and implemented in order to attain these goals, including:

- The national Growth and Poverty Eradication Strategy.
- Lao Tourism Strategy 2006–2020.
- Renewable Energy Development Strategy in Lao PDR 2025.
- Forestry Strategy to the Year 2020 of the Lao PDR.
- The National Socio-economic Development Strategy 2011–2020.
- Strategic Framework for National Sustainable Development Strategy for Lao PDR (2008).
- National Environment Strategy toward 2020.
- Industry and Commerce Development Strategy 2016–2020.
- Industry and Handicraft Development Strategy toward 2020.

So far, no specific policy framework or national strategy has been established that specifically addresses sustainable consumption and production (SCP).

8.2 Major Industry Structures and Situation of SMEs

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.

Even though industry plays a relatively minor role in the Lao economy, its importance has increased significantly. In 1987, industry represented only 11% of GDP, while in 2013 it represented 33.2%, a threefold increase since the introduction of the NEM policy. The number of enterprises increased from about 25,200 in 2004 [Kyophilavong, 2008] to about 124,567 enterprises in 2013, of which 99% are small- and medium-sized enterprises (SMEs) [Department of Small and Medium Enterprise Promotion, 2013].

SMEs are independent enterprises that are legally registered and operate according to the prevailing laws of the Lao PDR and are classified into the following size categories:

Small enterprises are those having an annual average number of employees not exceeding 19 persons or total assets not exceeding KIP 250 million (USD 31,875) or an annual turnover not exceeding KIP 400 million (USD 50,000).

Medium-sized enterprises are those having an annual average number of employees not exceeding 99 persons or total assets not exceeding KIP 1.2 billion (USD 150,000) or an annual turnover not exceeding KIP 1 billion (USD 125,000).

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 [Lao Statistics Bureau, 2013].

8.3 Sectoral Analysis

8.3.1 Industry

The main industry sectors in Laos to be suitable for economic development, as declared by the Lao government in 2014 are:

1. Manufacturing with a GDP share of 10.3% and average annual growth rate of 14.5%.
2. The mining sector with a 10.0% GDP share and average growth rate of 8.1% per year.
3. The construction sector with a GDP share of 6.7% and average yearly growth rate of 19.2%.
4. Electricity and water supply with a 4.2% GDP share and average growth rate of 0.2% per year.¹

The number of factories as recorded in 2010 stood at 35,948 and in 2012 at 38,126, a 5.7% increase in this two-year period. The number of employees in industry was recorded in 2010 at 116,826 and in 2012 at 135,273, showing a 13.6% increase in the two-year period. More information and historical data from 2010 to 2012 are presented in Table 8.1.

Worth mentioning, although the growth rate of the electricity sector in 2012 is negligible with only 0.2% compared to other industries, the GDP remained stable and value was created within the industry. It is known that electricity from hydropower has a significant export potential, where most of large-scale hydropower schemes are funded by foreign investment. It is thus assumed that revenues from electricity export go directly to foreign investors and are not counted as national revenue.

¹Source: Unpublished data obtained by author from the Lao PDR Ministry for Industry and Commerce.

Table 8.1: Data of industry 2010–2012

Description	Units	2010	2011	2012	Remarks
No. of factories	factory	35,948	34,623	38,126	
No. of employees	employees	116,826	123,414	135,273	
Total GDP by Industry Manufacturing	Million LAK	15,618,293	19,781,187	22,677,289	Value of the same year
Mining Electricity and water supply		5,440,923	6,246,070	7,456,422	
Construction		5,157,997	6,833,713	7,285,994	
		2,135,261	2,851,839	3,048,872	
		2,884,113	3,849,565	4,886,000	
Total industrial Growth Rate Manufacturing	%	17.5	14.6	11.4	Constant value of 2002 (refer to total GDP)
Mining Electricity and water supply		7.0	9.7	14.5	
Construction		12.6	5.2	8.1	
		63.1	29.5	0.2	
		20.0	24.8	19.2	
Total GDP Share to National Economy	%	28.0	30.6	31.2	Value of the same year
Manufacturing Mining Electricity and		9.8	9.6	10.3	
water supply Construction		9.3	10.6	10.0	
		3.8	4.4	4.2	
		5.2	5.9	6.7	
Percentage of GDP to total industry	%	100	100	100	Value of the same year
Manufacturing Mining Electricity and		35	31	33	
water supply Construction		33	35	32	
		13	14	13	
		19	19	21	
Total investment in industry	Million* Million LAK	170	150	140	

Note: The exchange rate was approx. 8,000 LAK (Lao kip currency) per USD 1 in 2012.

8.3.2 Sustainable tourism

Apart from the four key industry sectors, tourism and its related products and services are among the fastest growing sectors, which create jobs and revenue and therefore contribute significantly to the Lao economy. Thus, the government has placed tourism as the first out of 11 priority sectors contributing to economic development. The tourism sector is now a major contributor (second biggest revenue source after manufacturing and mining) to national income (7–9% of GDP) and employment [Lao Statistics Bureau, 2013].

The Lao PDR opened its doors to tourism in 1989 and ever since the number of tourist arrivals has risen annually. From 2002 to 2011, the total number of visitors grew by an annual average of 14%, from 735,662 to 2.7 million. In 2011, the total contribution of tourism to GDP was USD 1.4 billion, and the sector was responsible for 461,500 jobs, accounting for 16% of total employment in the country. No sector other than tourism has an equally positive combination of high GDP contribution with 37.4% of GDP in 2013 [Lao Statistics Bureau, 2013] and high employment generation with 16% of the workforce, and high growth rate 14% [Swiss Cooperation in the Mekong Region, 2013]. In 2012, the number of international tourists visiting Laos reached 3.3 million, which generated revenue of almost USD 517 million. The number of foreign visitors arriving in Laos in 2014 exceeded 4.15 million. The government therefore targeted 5 million international tourists for 2015 and expected revenue of around USD 1 billion [Cleaner Production Center Laos, 2012].

As numbers of tourists continue to increase every year and tourist sites are developed, there are concerns about the sustainability of tourism sector, and this issue has been addressed since the early 21st century. The government has developed strategies to promote and develop sustainable tourism, as outlined in the Lao PDR Tourism Strategy 2006–2020, and undertaken participatory ecotourism projects, often through international cooperation. A good example is the Nam Ha Ecotourism Project Phase I, which was established and implemented from early 2000 to 2004 in the Luang Namtha province by Lao National Tourism Authority (NTA) and the UNESCO-Lao NTA, in cooperation with the Ministry of Agriculture and Forestry and the Ministry of Information and Culture. The project's main donors were the Government of New Zealand, through NZODA, and

the Government of Japan, through the International Finance Corporation's Trust Funds Programme [Lyttleton and Allcock, 2002].

The Nam Ha Ecotourism Project Phase II was launched in January 2005, providing support to the Provincial Tourism Office to identify new products and strengthen project management systems. In Luang Namtha province, the German development agency, GIZ, and the European Union (EU) are supporting ecotourism planning and management activities in Muang Singh and Vieng Phoukha districts [Lao National Tourism Administration, 2005].

Another example is the GMS Sustainable Tourism Development Project (2009–2013), which was mainly financed by the Asian Development Bank with additional budgetary resources from the Lao government. The Lao National Tourism Administration was the executive agency responsible for the coordination, management, and implementation of the project in the nine target provinces of Champasack, Salavanh, Savannakhet, Vientiane Province, Houaphanh, Oudomxay, Xayyabouly, Bokeo, and Luang Namtha. The main goal of the project was to contribute to the sustainable socio-economic development of Lao PDR with an aim to reduce poverty, contribute to the sustainable development and protection of natural and cultural heritage, and protect vulnerable groups from exploitation [ADB, 2008]. The main result of this project was the increase in ecotourism locations, especially in the area of Siphandone. Tourist guides were trained through intensive capacity-building courses and the income and livelihood of local communities were improved. Another important aspect of the project was the reduction of environmental impacts through better management of projects and involvement of local communities.

8.3.3 *Agriculture and forestry*

Agriculture, mostly subsistence rice farming, dominates the Lao economy, employing an estimated 85% of the population and producing 51% of GDP during the 1900s. The Lao government has committed to improving food security as part of its efforts to graduate from the category of least-developed countries by 2020 [FAO, 2015]. As recorded by the Lao Statistics Bureau in 2013, agriculture (including plantation, livestock, forestry, and fishery) contributed 23.5% to the GDP. The agricultural land as recorded in 2000 was 18,360 km² equal to 8% total area; arable land is

Table 8.2: Lao top 10 food and agricultural commodities production in 2012 (FAOSTAT, 2013)

Rank	Commodity	Production (int. prices \$1,000)	Production (MT)
1	Rice, paddy	865,350	3,489,210
2	Vegetables, fresh	171,497	910,085
3	Bananas	102,823	365,100
4	Cassava	99,740	1,060,880
5	Maize	98,677	1,125,485
6	Coffee, green	93,824	87,330
7	Meat indigenous, pigs	88,814	57,775
8	Meat indigenous, cattle	71,238	26,371
9	Tobacco, unmanufactured	64,666	40,600
10	Meat indigenous, buffalo	52,704	19,580

8,770 km², which increased to 10.7% in 2012 [World Bank Indicators, 2014]. The latest record of the Lao Statistical Bureau shows a cultivated area of 14,280 km². The agricultural products consist of rice, sweet potatoes, various types of vegetables, and meat (see Table 8.2).

As already mentioned above, deforestation has been a pressing environmental issue for Laos. Underlying this chapter and the approach employed by a SWITCH-Asia project is promotion of rattan as a non-timber forest product and sustainable rattan management to address deforestation. The case study of SWITCH-Asia project “Sustainable Rattan” is described in Box 8.1.

8.3.3.1 Cleaner production and sustainable rattan harvesting

Implemented in 2009–2011 by the Lao National Chamber of Commerce and Industry (LNCCI) in collaboration with world wide fund (WWF) and the Vietnam National Cleaner Production Centre, the Lao Cleaner Production Centre played a role in providing cleaner production (CP) assessments to rattan factories and creating CP awareness to staff in three rattan factories: Daenlao in Vientiane province, Chaemchanh in Vientiane, and Phonemyxay in Bolikhamxay. Taking the Daenlao as an example, like

Box 8.1 SWITCH-Asia Case Study: Sustainable Rattan Project

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 [Campbell and Knowles, 2011].

other rattan factories, it faced the problem of high loss of rattan as waste. End-cuttings of rattan and the short lengths, which were stored to make other products, were not used. The waste from processing, like peeling, splitting, sanding, and cutting also were not used. This gives the company a high potential to save money and improve production efficiency, where existing waste was used as raw material for new products, such as small chairs, bins, drawers, trays, etc. These products opened new markets and required new design or re-design of existing products which included process control, modification of equipment, and use of new processing technology.

The project's main improvements were:

- Redesign of furnace: the usual furnace had two firing gates which necessitated much fuel for burning. The CP experts recommended to close one firing gate and replace it with chimney, making it higher than the length of the pan.

Table 8.3: Specific consumption for semi product at Daenlao rattan company before and after CP measures (CP assessment report Daenlao rattan factory, CPC-L 2012)

No.	Input	Unit	Jan–June 2010	Jan–June 2011
			Before CP	After CP
1	Raw rattan <i>Calamus poilanei</i> (for semi product production)	tonne/tonne raw rattan	3.4	3.4
2	Fuel wood (for boiling)	kg/tonne	983	936
3	Diesel oil (for Rattan boiling)	litre/tonne	148	139
4	Electricity	kWh/tonne	525	528
5	Water for washing	m ³ /tonne	17.4	16.4
6	Rattan waste (<i>Calamus poilanei</i>)	kg/tonne	32	30

- Optimisation of feeding system: the feeding system was rebuilt to utilise waste of rattan sawdust as fuel, in combination with firewood.

The results of CP implementation in rattan factories are presented in the following tables. Table 8.3 shows the resource consumption before and after CP practice through the implementation of low-cost and no-cost options, most in the category of good housekeeping and process control. Reductions were achieved in the fuel wood and diesel oil consumptions, which were followed by a decrease in the electricity and water consumptions. Table 8.4 shows a significant reduction of rattan waste in semi-finished product and furniture production.

8.3.3.2 CP practices for villagers

The challenges that the project faced were low product quality, with mould and fungi affecting rattan baskets produced by villagers to be exported to European market. Thus, the CP Centre was involved to provide technical assistance. The training course for villagers was to provide knowledge of CP techniques in rattan processing, including certain techniques for products destined for the European market.

Following the CP training, the communities saw an increase in villagers’ income from sustainable rattan harvesting and production (weaving, splitting),

Table 8.4: Resource consumption of furniture production at Daenlao rattan factory before and after CP measures (CP assessment report of Daenlao, CPC-L 2012)

No.	Input	Unit	Jan–June 2010 Before CP	Jan–June 2011 After CP
1	Raw rattan <i>Calamus poilanei</i> (for furniture production)	kg/tonne	1.48	1.48
2	Varnish only for furniture	litre/tonne	—	—
3	Thinner (for painting furniture)	litre/tonne	—	—
4	Rattan waste <i>Calamus palustris</i> (as compared to the input material, i.e., small rattan <i>C. palustris</i>)	kg/tonne	327	367

better rattan forest management through Forest Stewardship Council (FSC) certificates, and better relationships between the project, local authority, and local community. The companies engaged in the project took the role of buyers for the villages, strengthening the export of Lao rattan products to Europe (see Figure 8.1).

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.



Figure 8.1: Pongpatao villagers making rattan baskets, Bolikhamxay province, Lao PDR

Due to its success, the project was continued in phase III until 2014 with funding from IKEA. The objective was to strengthen the project's achievements through the following main activities:

- Strengthen village-level rattan management groups.
- Expand the FSC-certified sustainable forest resource management areas.
- Establish strong linkages with IKEA and other companies.
- Improve research on rattan ecology and biodiversity.

The social benefits of the project consist of increased number of secure jobs as well as revenue generation for villagers.

8.4 SMEs, Policies, and Strategies for SCP

In the Lao PDR, SMEs represent 99% of all enterprises. They are small even in comparison to SMEs in other ASEAN countries. Regarding sustainability, Lao SMEs lack funds and skills to promote sustainability activities or CP in the medium and high cost options. From the national authority or government side, there is still a lack of awareness about the necessity to establish a national policy framework and marketing for sustainability. The concept of SCP is still new for Lao SMEs, even though the CP concept has been introduced to Laos and implemented since 2005. In this context, there is an urgent need for:

- Creating national public awareness on SCP.
- Formulating a national policy framework on SCP.
- Human resource and skill development for SMEs.
- Information on best available technologies (BAT) and best available environmental practices (BEP), innovation on technology, product and process.
- Financial support for new BAT/BEP for SMEs and research.
- Marketing and tools for new market development.

As SCP is a new topic for Lao PDR, there is still lack of policy promotion. However, the government has agreed to contribute to related activities. With support from the SWITCH-Asia Programme, UNEP and the 10 Year Framework of Programmes on SCP (10YFP), a training on “SCP — the 10YFP and SCP within Southeast Asian Policies — Building Sustainability into Southeast Asian Policies Together” was held on 21–23 October 2014 in Vientiane. The event was an important milestone for the country to start SCP activities and later to develop its own SCP policy. The sectoral strategies described below will provide the backbone for SCP in Lao PDR.


8.4.1 *Lao Tourism Strategy 2006–2020*

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 [Lao People’s Democratic Republic, 2005]. Based on the strategy and the sustainable tourism pilot projects described above, sustainable tourism offers strong potential to support the overall sustainable development of the Lao economy.

8.4.2 *Renewable energy development strategy in Lao PDR*

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 [Vongchanh, 2012].

In 2011, the Ministry of Energy and Mines issued a Renewable Energy Development Strategy intending to make 30% of the country's energy sources renewable by 2025 [Lao People's Democratic Republic, 2011]. The main priorities include biofuels, small hydroelectricity schemes, and biomass. To reduce fossil fuel imports, the government has outlined a tentative vision to reach 10% of the total transport energy consumption to be derived from biofuels. The strategy aims to develop renewable energy resources which have not yet been widely explored in the Lao PDR. These are to replace resources that will be exhausted in the future ("non-renewable energy" such as fossil fuels, coal, natural gas), in order to ensure an adequate supply of energy, energy efficiency (EE), and conservation, to bring socio-economic benefits and finally to ensure environmentally and socially sustainable development through enforcement of adequate safeguards [Lao People's Democratic Republic, 2011]. According to Vongchanh [2012], the potential of biomass includes energy crops, such as oily crops (palm, *Jatropha*, *Veronica montana*, sunflower, beans, coconut), sugarcane, cassava, corn, and quick-growing tree, and aquatic cultures. Other sources of biomass are organic waste which includes residues from agriculture-forestry production, by-products from agro-forestry industry (e.g., sawdust, wood chips, rice husks, corncobs, livestock residue, and manure); and municipal waste (household waste, communal waste, food-processing waste). It was estimated that utilisation of livestock wastes for biogas production could generate around $2.8 \times 10^8 \text{ m}^3$ of biogas per year or equivalent to $5 \times 10^8 \text{ kWh}$ electricity (about 216



Name	Improved Cookstove	Tao Payat	Tao Dam	Tao Cement
Efficiency	39%	32%	28%	24%
Estimated savings	N/A	18%	28%	39%

Figure 8.2: Test result of the ICS

Source: SWITCH-Asia “ICS” Project.

million tonnes of oil equivalent/MTOE). Currently, most Lao households use firewood, charcoal and other biomass as cooking fuels. Biomass accounts for almost 70% of the nation’s overall energy consumption [Lao People’s Democratic Republic, 2011], resulting in high external costs, environmental degradation and an estimated 2,000–3,000 annual premature deaths from indoor air pollution. Most of the traditional and old cook stoves currently in use are very inefficient. Improved cook stoves (ICS) can better efficiency by up to 10–15% compared to conventional cook stoves (see Figure 8.2).

The new (improved) cook stove model is being promoted by the SWITCH-Asia project “ICS” which is described in Box 8.2.

8.5 Status of International Aid Cooperation for Sustainability

Lao PDR receives support from many international organisations to pursue a sustainability development pathway. UNEP works closely with the government on environmental, climate change and poverty issues, and the United Nations for Industrial Development Organisation (UNIDO) on industrial pollution issues. Another leading organisation which has an increasing role in Lao PDR on sustainable development is

Box 8.2 SWITCH-Asia Case Study: ICS Project

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.
6. A national standard of stoves is endorsed.
7. 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.

(Continued)

Box 8.2 (Continued)

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 (see Figure 8.3). 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 [Teune, 2015].



Figure 8.3: Testing and production of the ICS

Further project information is available on: www.switch-asia.eu/projects/cook-stoves-programme-laos/www.snvworld.org/en/countries/lao-pdr.

the EU and through its SWITCH-Asia Programme, the EU promotes SCP implementation in the country. The EU’s support and contributions are described in more detail below.

8.5.1 *Development cooperation with the EU*

In recent years, Lao PDR has increasingly received support from the EU. The EU has allocated up to EUR 60 million to Laos under its bilateral cooperation programme over the period of 2014–2015 to improve basic education, food and nutrition, security, and strengthen good governance as well as the rule of law and human rights. The EU and Laos have engaged in the Forest Law Enforcement, Governance, and Trade (FLEGT) process to reduce illegal logging. This bilateral cooperation programme has continued into 2015, but environmental sustainability is not one of the main topics. Cooperation also covers other topics such as human rights. For this purpose, the 5th Meeting of the Informal Bilateral Working Group on Governance and Human Rights was held in May 2014 in Brussels to promote information exchange on human rights in both Laos and the EU. In October 2014 the 7th EU–Lao PDR Joint Committee meeting was held in Brussels on a broad range of issues, including political and economic developments [European Union External Action, 2014]. Laos also engages in the regional SWITCH-Asia Programme (see Table 8.5) and the SCP initiatives held through UNEP. The majority of SWITCH-Asia projects implemented in Laos are multi-country led by either European or ASEAN institutions. An important partner for the projects has been the LNCCI. The sectors and technologies addressed include EE appliances, efficient cook stoves, rattan products, production, and marketing of organic food and innovative handicrafts. The following table provides an overview of current and completed SWITCH-Asia projects implemented in Laos.

To promote SCP policies in Laos, the SWITCH-Asia Programme's Regional Policy Support Component coordinated by UNEP, worked together with the Lao Ministry for Natural Resources and Environment (MONROE) to initiate national policy on SCP. For this purpose, a three-day workshop on SCP was organised in October 2014, involving the International Resource Panel Secretariat.

The event consisted of the following two workshops:

1. The Rio+20 10YFP on SCP: Building the knowledge of National Focal Points on SCP (held on 21–22 October 2015 in Vientiane); and

Table 8.5: Overview of SWITCH-Asia projects in Laos (www.switch-asia.eu)

Name of Project	Period	Main Implementing Organisation	Places of Implementation	SCP Practice	Brief Description of Objectives or Impact
ASEAN Energy Manager Accreditation Scheme (AEMAS)	Feb 2010– Jan 2014	ASEAN Center for Energy	Laos, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand, Vietnam	EEaccreditation	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 ₂ emissions of up to 55,000 tonnes
ICS Programme Laos PDR	Feb 2013 –Jan 2017	Oxfam Novib (lead); Association for Rural Mobilisation and Improvement (NORMAI) (Lao partner)	Vientiane, Savannakhet, Khammouane, and Champassak	Sustainable consumption	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.

(Continued)

Table 8.5: (Continued)

Name of Project	Period	Main Implementing Organisation	Places of Implementation	SCP Practice	Brief Description of Objectives or Impact
Eat Greener — Changing Food Consumption Patterns: A Sustainable Approach towards Economic Development in Lao PDR	2014–2015	VZW Oxfam Solidariteit (lead); Phone Soung Agricultural Development Project (PSADP) (Lao partner)	Vientiane, Luang Prabang, Champassak, Khammouane, Xieng Khouang	Sustainable consumption, eco-labelling	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	Jan 2013– Dec 2016	European Copper Institute	Laos, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Vietnam	EE, energy standard	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.
--	--------------------------	------------------------------	---	------------------------	--

(Continued)

Table 8.5: (Continued)

Name of Project	Period	Main Implementing Organisation	Places of Implementation	SCP Practice	Brief Description of Objectives or Impact
Sustainable Product Innovation in Vietnam, Cambodia, and Laos (SPIN-VCL)	April 2010– Sept 2014	Delft University of Technology (lead); LNCCI (Lao partner)	Cambodia, Vietnam, and Laos	Product design for sustainability	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	Jan 2009– Dec 2011	WWF Austria (lead); LNCCI (Lao partner)	Multi-country project in Laos, Vietnam, and Cambodia	CP, eco-certification	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.
-------------------------------	--------------------------	---	--	--------------------------	--

2. Sustainable Resource Management Science — Policy Seminar conducted by UNEP's International Resource Panel (held on 23 October 2015).

Both workshops aimed to support Southeast Asian policy makers and stakeholders to build their knowledge on how SCP policies could support the region's sustainable development and meet the needs of the expanding consumer and producer base in Southeast Asian countries, especially Laos. Another policy project to formulate SCP at national level is currently undertaken with the support from the SWITCH-Asia Programme, as reported by the Department of Pollution Control of the Lao MONRE. The project, titled "Quality support programme," is being implemented from 2015 to 2017. The objective of the project is (1) creating awareness on SCP, (2) developing indicators on SCP for Laos, and (3) developing an SCP curriculum at the National University of Laos. This SCP policy project will contribute to sustainable development in Laos as well. However, it is just a start compared to SCP activities in other ASEAN countries. Thus, there is need for stronger support from the EU SWITCH-Asia Programme to advance the SCP policy agenda in the country.

8.6 Summary and Conclusion

This chapter reviewed the state of SCP in the Lao PDR. It is one of the South East Asian countries undergoing rapid economic development since the announcement of the New Economy Mechanism in 1986, especially from the 1990s when the Lao government opened the country to foreign investment. The main industries which contribute to the Lao economy are manufacturing, hydropower, construction, and mining sectors with high growth rates, but the latter has caused increasing concern for its environmental and health impacts. The manufacturing sector is dominated by SMEs and has grown continuously with an average annual growth rate of 14.5%, providing foodstuffs and consumer goods for the Lao people, reducing import dependency and creating jobs locally. Apart from the four main industry sectors, tourism is an important service sector industry, which creates jobs and revenue.

Simultaneously to rapid economic growth, concerns about social, and environmental impacts are mounting. Sustainability is becoming an increasingly relevant theme for policy and industry. Despite many existing laws, legislation, policies, and strategies related to environmental protection, there is still a need to have specific policies, strategies and tools for SCP implementation, partly because SCP concept is still new for the country. The policy initiatives on SCP have only begun in October 2014 through a workshop supported by the SWITCH-Asia Regional Policy Support Component/UNEP and the Ministry of Natural Resources and Environment. To move SCP further up the government's agenda, more support is needed from international organisations to run projects on development of SCP policy and strategy. This is vital so that Laos will not lag far behind other ASEAN countries, many of which have already established their national SCP frameworks.

The two case studies from the SWITCH-Asia projects implemented in Laos demonstrate the success of SCP promotion, especially in sustainable rattan processing and harvesting and energy-efficient cook stoves at household level. The success of the SWITCH-Asia projects is based on strategic collaboration of various stakeholders on national, regional, and local levels. It is suggested that the SWITCH-Asia Programme and the 10-Year Framework Plan on SCP could also support the promotion of sustainable production among SMEs in the field of manufacturing, agro-industry, renewable energy, and for sustainable consumption in the field of trade, consumer education, and eco-tourism.

References

- ADB (2008). *Proposed Grant to the Lao People's Democratic Republic and Loan to the Socialist Republic of Viet Nam: Greater Mekong Sub-region Sustainable Tourism Development Project*. Available on: http://www.ecotourismlaos.com/downloads/GMS_STDP_Project%20Document.pdf.
- Asia Pacific Parliamentary Forum (2009). *17th Annual Meeting of the Asia Pacific Parliamentary Forum (APPF)*. Vientiane Capital, Lao PDR, 11–15 January 2009.
- Campbell, R. and Knowles, T. (2011). *Project Evaluation of WWF Sustainable Rattan Project Lao PDR*. Final report. October 2011. Retrieved on May 5, 2015. Available on: <http://www.ecolarge.com/wp-content/uploads/2012/07/WWF-rattan-project-evaluation-Lao-PDR-FINAL.pdf>.

- CIA World Factbook (2007). *The World Factbook*. Central Intelligence Agency (US). Retrieved on May 01, 2015. Available on: <https://www.cia.gov/library/publications/download/download-2007/>.
- Cleaner Production Center Laos (2012). *Annual Report 2012*. Retrieved on May 5, 2015. Available on: www.laocpc.org.
- Department of Small and Medium Enterprise Promotion (2013). *Unofficial record 2013 of SME Data Obtained by Author from Department of Small and Medium Enterprise Promotion (DOSMEP)*.
- European Union External Action (2014). *The European Union will provide up to EUR 60 million in grants to Laos in 2014–2015*. Press Release 8 December 2014. Retrieved on May 15, 2015. Available on: http://eeas.europa.eu/statements-eeas/2014/141208_02_en.htm.
- FAOSTAT (2013). *Lao PDR Commodities Production Data 2012*. Retrieved on May 14, 2015. Available on: <http://faostat.fao.org/site/339/default.aspx>.
- FAO (2015). *Lao People's Democratic Republic and FAO*. Available on: <http://www.fao.org/3/a-av023e.pdf>.
- Gender Resource Information & Development Center (GRID) (2005). *Lao PDR Gender Profile 2005*. Available on: <http://siteresources.worldbank.org/INTLAOPRD/Resources/Lao-Gender-Report-2005.pdf>.
- Kyophilavong, P. (2008). SME development in Lao PDR. In Lim, H. (ed.), *SME in Asia and Globalization, ERIA Research Project Report 2007–5*, pp.191–215. Available on: <http://www.eria.org/SMEs%20Development%20in%20Lao%20PDR.pdf>.
- Lao PDR Lao National Tourism Administration (2009). *Project Baseline Report — November 2009, GMS Sustainable Tourism Development Project*.
- Lao People's Democratic Republic (2011). *Renewable Energy Development Strategy in Lao PDR*. October 2011. Available on: http://www.asialeds.org/sites/default/files/resource/file/LIRE-Renewable_Energy_Development_Strategy_in_Lao_PDR.pdf.
- Lao People's Democratic Republic (2005). *Lao PDR Tourism Strategy 2006–2020*. Available on: <http://www.tourismlaos.org/files/files/Lao%20PDR%20Tourism%20Strategy%202006-2020%20in%20English.pdf>.
- Lao National Tourism Administration (2005). *National Ecotourism Strategy and Action Plan 2005–2010*. Retrieved on May 14, 2015. Available on: http://www.ecotourismlaos.com/directory/publications/lao_nta_ecotourism_strategy.pdf.
- Lao Statistics Bureau (2013). *Statistical Yearbook 2013*. Retrieved on May 20, 2015. Available on: <http://www.lsb.gov.la/en/Statisticalyearbook2013.php>.

- Lao DSM (2013). Overview of energy consumption 2013. *Lao Demand Side Management Project*. Retrieved on May 12, 2015. Available on: www.laodsm.net/index.php/en/energy-use-statistics.
- Lyttleton, C. and Allcock, A. (2002). *External review 'Tourism as a Tool for Development' UNESCO-Lao National Tourism Authority Nam Ha Ecotourism Project*, July 6–18, 2002. Available on: <http://unesdoc.unesco.org/images/0014/001448/144843e.pdf>.
- RESDALAO (2005). Final report on energy status in Lao PDR. *Renewable Energy for Sustainable Development Association (RESDALAO)*. Available on: http://www.sunlabob.com/data/documents/energy_issues/O-05-11-Laos_Energy_Status.pdf.
- Swiss Cooperation in the Mekong Region (2013). *Supporting the Tourism Sector to Alleviate Poverty in Lao PDR*. July 23, 2013. Available on: <http://www.sdcmekong.org/tag/tourism/>.
- SWITCH-Asia Programme (2014). 80 projects at a glance. *Fact Sheet Brochure SWITCH-Asia Programme*. Available on: <http://www.switch-asia.eu/publications/2014-project-fact-sheet-brochure/>.
- Teune, B. (2015). A Recipe for Success in the Dissemination of Improved Cookstoves. *A Case Study from Lao PDR*. SNV Lao PDR, February 2015.
- UNDP (2013). *The Millennium Development Goals, Progress Report for the Lao PDR 2013, United Nations Development Programme*. Available on: http://www.la.undp.org/content/lao_pdr/en/home/library/mdg/mdgs-progress-report-lao-pdr-2013.html.
- UNDP (2014). The Global Human Development Report. *United Nations Development Programme*, 2014.
- UNdata (2015). Data for Lao PDR. Available on: <https://data.un.org/CountryProfile.aspx?crName=Lao%20People%27s%20Democratic%20Republic>.
- UNEP (2014). Sustainable consumption and production — the 10YFP and SCP within South East Asian Policies — Building sustainability into South East Asian Policies together. *Training Workshop Agenda*. Available on: http://www.unep.org/10yfp/Portals/50150/downloads/Agenda_SCP_10YFP_IRP_Vientiane_21–23October.pdf.
- Vongchanh, K. (2012). Lao PDR country report: the need for sustainable renewable energy in Lao PDR. *Report from SUSTAINABLE FUTURE ENERGY 2012 and 10th SEE FORUM*, 21–23 November 2012, Brunei Darussalam. Retrieved on April 30, 2015. Available on: <http://www.seeforum.net/countryreport/laopdr.html>.
- WEPA (2015). Laos database. *Water Environment Partnership in Asia*. Available on <http://www.wepa-db.net/policies/state/laos/overview.htm>.

World Bank (2015a). World development indicators — GDP ranking. Updated 1 July 2015. Available on: <http://data.worldbank.org/data-catalog/GDP-ranking-table>.

World Bank (2015b). Lao PDR country profile. Available on: <http://www.worldbank.org/en/country/lao>.

World Bank Indicators (2014). *Laos Agricultural Land % of Land Area*. Available on: <http://data.worldbank.org/indicator/AG.LND.AGRI.ZS>.