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## **Chapter 9**

# **Promoting Sustainable Consumption and Production for a Better Future in Nepal**

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### **9.1 Introduction: Nepal's Development Challenges**

Nepal is a small landlocked sovereign state located in South Asia. It lies in the Himalayas and is bordered between two giant neighbours — China in the North and India in the other three directions. The total area of the country is 147,181 km<sup>2</sup> consisting of 83% mountains and hills and 17% the flat terrain of Terai. Nepal is rich in natural resources and biodiversity with plenty of flora and fauna [Worldatlas, 2015]. High snow-capped mountains in the North, green terrace farms in the mid hills and fertile plains in the South provide untapped opportunity. Nepal is home to Mount Everest, the tallest mountain in the world with a height of 8,848 metres above sea level. It is also rich in cultural diversity, language, ethnicity, and is home to some of the best World Heritage sites according to UNESCO.

The total population of the country is around 28 million with an average annual per capita income of USD 730. The literacy rate of Nepal is 57.4%, out of which male literacy is 71.1% and female 46.7% [UNESCO, 2015]. The life expectancy of an average Nepali is 67 years. According to the World Bank, Nepal has achieved remarkable progress over the last

years, where it managed to halve the percentage of people living on less than USD 1.25 a day in only seven years, from 53% in 2003–2004 to 25% in 2010–2011 and is continuing to make progress [World Bank, 2015a, 2015b]. Several social indicators in education, health, and gender have also improved. However, according to the Human Development Index (HDI) report, Nepal stands 145<sup>th</sup> in the world. Nepal needs to do more in the areas of education, health, income generation, infrastructure development, and food security. Nearly one quarter of the population still lives in extreme poverty.

Agriculture is key to Nepal's economy as the majority of the population relies on it for livelihood, work and subsistence. Production is largely for household consumption and the country has yet to progress into commercial agriculture. Promotion and development of the agricultural sector is imperative to Nepal as it continues to import food. Tourism is an important sector that promotes small enterprises and is a significant contributor to Gross Domestic Product (GDP). Many tourists are attracted to Nepal due to its natural scenic beauty; nature tourism is a huge attraction, catering for trekking, mountaineering, white water rafting, wildlife safaris, etc. Many tourists are also attracted to cultural, traditional, and religious activities. According to immigration office at Tribhuvan International Airport in Kathmandu, 585,981 foreign tourists came to Nepal via air in 2014 [NepalTourNews.com, 2015]. Nepal, as the birthplace of Lord Buddha, also attracts a large number of pilgrims.

Nepal is rich in hydropower resources, which are the major source of energy. Yet, the huge potential for generating hydro energy is still untapped. Therefore, the country suffers from an acute energy shortage adding an extra burden to the poverty-stricken country. Since the mid-90s, Nepal has prioritised and implemented a renewable energy model by incentivising investment in other energy sectors, such as solar, biogas, and wind. Rural energy supply continues to rely on agro-forest products, kerosene, and biogas for cooking and lighting.

Nepal envisions upgrading from the status of a Least Developed Country (LDC) to a middle-income country (MIC) by 2022. In order to achieve this target, much planning and investment will be required at the national level, including attracting international investment, and creating enabling environments for business to flourish. Furthermore, Nepal will

need to prioritise significant investment in the energy sector, infrastructure development, agriculture, education, health, and industry. Simultaneously, the country will need to devise strong social and environmental friendly policies regarding production and consumption of resources.

In 2015, the Government of Nepal initiated discussion on a low carbon and climate resilient development strategy, within which energy, transportation, and industry, and commerce are prioritised. With a growing population and simultaneously degrading environment, it is urgent for Nepal to produce and consume more sustainably. In a small and emerging economy, small- and micro-enterprises have a crucial role in leading the country to sustainable development pathways.

In April 2015, Nepal was hit by a magnitude 7.6 earthquake, resulting in over 8,000 fatalities and more than 20,000 injured [UNHCR, 2015]. The earthquake also left hundreds of thousands homeless, and the government estimated the overall damage to be about USD 10 billion with rebuilding estimated at nearly USD 7 billion. This disaster left the country paralysed in its economic activities, having lost infrastructure, and other essential services, as well as causing severe damage to Nepal's cultural heritage sites, which are major attractions for tourists.

Nepal relies on international support for the implementation of its plans and programmes. According to the Ministry of Finance (MoF) [MoF, 2013], foreign aid plays a significant role in the country's socio-economic development, contributing nearly 26% of the national budget. Donors such as the European Union (EU), the United Kingdom (UK), Germany, Norway, the United States (US), and Denmark are development partners of Nepal; multi-lateral agencies like the World Bank, Asian Development Bank, and various UN agencies also provide significant assistance. The presence of international non-governmental organisations (INGO) is also important; in recent years, neighbouring countries like China and India, and new partners like Saudi Arabia and South Korea, have assisted Nepal in its economic development efforts. The MoF has, therefore, created an online Aid Management Platform for transparency and accountability, and to measure the effectiveness of an aid in the country. Substantial foreign assistance is directed towards projects for sustainable consumption and production (SCP) and environmental integrity [MoF, 2015].

## 9.2 Opportunities for SCP in Nepal

Like other Asian developing countries, Nepal is in the process of modernisation, which creates an unprecedented level of pressure in balancing the socio-economic growth with environmental conservation. To mitigate negative impacts on Nepal's natural resources and environment, there is an immediate need to change the way that goods and services are currently produced. Sustainability cannot be attained within the present context of over-production and over-consumption. Nepal's use of resources is unsustainable, produces large amounts of waste and rapidly pollutes its environment. In particular, waste generation is increasing at an alarming rate and Nepal does not have modern disposal or recycling facilities yet. In this context, embracing SCP principles is urgently needed.

If the correct development course is chosen, Nepal can put itself on track to achieve SCP principles. For this purpose, Nepal needs to learn from other countries and decouple its rapid economic growth from resource depletion. However, targeting double-digit economic growth has hitherto not been sustainable and often been detrimental to the environment. Over-extraction of natural resources, extreme business competition, and over production of goods and services can lead to low quality of human life both in the short and long run. Serious air pollution in Kathmandu and its impact on health are often taken as pertinent example. SCP principles promote quality of life, doing more with less, and preserving environment for future generations. Embracing SCP principles would help tackle poverty in the country, for example, by creating new (green) jobs, enabling resource management on local level, promoting local production of organic food, generating renewable energy, and attaining fair trade. Nepal has already taken some constructive steps towards SCP implementation, which should be built on.

Against this backdrop, the EU SWITCH-Asia Programme is currently supporting Nepal to switch to SCP patterns through several grant projects. The SWITCH-Asia projects implemented in Nepal have attempted to promote behavioural and technological changes in order to produce goods and services more sustainably. In general, these projects aim at small- and medium-sized enterprises (SMEs) and the way they do business, which in turn affect the consumers. Table 9.1 gives an overview of the SWITCH-Asia projects implemented in Nepal.

Table 9.1: SWITCH-Asia projects implemented in Nepal

Name of Project	Period	Main Implementing Organisation	Places of Implementation	SCP Practice	Brief Description of Objectives or Impact
METABUILD	Mar 2016– Feb 2020	The Energy and Resources Institute (TERI), India	Nepal, Bangladesh, Sri Lanka	Resource efficiency and cleaner production (RECP)	To implement sustainable production processes and practices in 400 SMEs and to create a conducive environment for further adoption of sustainable production processes in the metal products supply chain for the building and construction sector.
Up-Scaling the Production and Consumption of Bio- Energy to Reduce Carbon Emissions and Enhance Local Employment	Jan 2014– Dec 2017	HELVETAS Swiss Inter- cooperation	Nepal	Sustainable/ bio-energy	Contribute to the national goal of poverty reduction through up-scaling the production and industrial consumption of bio- energy, thereby increasing employment and reducing carbon emissions.

(Continued)

Table 9.1: (Continued)

Name of Project	Period	Main Implementing Organisation	Places of Implementation	SCP Practice	Brief Description of Objectives or Impact
Green Homes — Promoting Sustainable Housing in Nepal	Jan 2013– Dec 2015	United Nations Human Settlement Programme Nepal (UN-Habitat)	Nepal	Sustainable building	Create an enabling policy environment to promote sustainable housing; strengthening supply chains for sustainable housing and building capacity of SMEs to deliver household-level green technologies and services.
Sustainable Production of Commercially Viable Products from Municipal Waste through Public–Private Partnerships in Green SMEs, Green City, Green Agro Products, and Green Employment Generation (PPP for 4Gs)	Jan 2014– Dec 2018	Winrock International	Nepal	Sustainable waste management	Enable a sustainable waste management system, construction and management of compost plant through Public–Private Partnership approach, promotion of compost use for organic tea and vegetable farming, and mobilisation of financial institutions to increase access to credit for the enhancement of organic farming.

Enhancing Sustainability and Profitability of the Carpet and Pashmina Industries in the Kathmandu Valley	Jan 2014– Jul 2017	Mercy Corps	Nepal	Cleaner production, resource efficiency	Increase resource efficiency, profitability, and sustainable growth by mobilising private sector and relevant public sector authorities to reduce fuel and water use, and water pollution in the Nepali carpet and pashmina industries.
Sustainable and Efficient Industrial Development in Nepal and Bhutan/ SEID (a multi-country project)	Feb 2012– May 2015	Centre for Appropriate Technology (GrAT)	Nepal, Bhutan	Appropriate technology, resource efficiency	Contributes towards sustainable development of Nepal's and Bhutan's economy with clear focus on industrial sectors that impact environment, employment generation, and poverty alleviation.

(Continued)

Table 9.1: (Continued)

Name of Project	Period	Main Implementing Organisation	Places of Implementation	SCP Practice	Brief Description of Objectives or Impact
VSBK — Vertical Shaft Brick Kilns and Other SCP — Sustainable Construction Practices	Jan 2012– Apr 2015	Deutsche Management Akademie Niedersachsen (DMAN)	Nepal	Cleaner production, resource efficiency	Promotion of SCP patterns in the construction industry, by raising awareness of private sector stakeholders for green building materials and solutions, and by providing consumer information on the benefits of clean energy and energy-saving building material.
Proposal for enhancement of sustainable production of lokta handmade paper production in Nepal	Jan 2009– Dec 2011	Nepal Handmade Paper Association	Nepal	Resource efficiency, sustainable production	

Source: SWITCH-Asia Project Fact-sheet Brochure (2014).



### 9.3 Nepal's Industry Structure

The industrial sector in Nepal is still small but growing steadily, being placed under the administration of the Ministry of Industry (MoI). Two other major bodies, the Department of Industry (DoI) and the Department of Cottage and Small Industry (DCSI), fall under its remit. With these dedicated institutions and their policies, Nepal is steadily progressing towards industrialisation. It was only after 1951 that Nepal started to look outward for its sustainable economic growth, liberalising its economy and inviting international investors. Economic growth grew rapidly after 1990, but was soon hindered by the civil war that lasted for nearly a decade. Nepal is now gradually attracting international investment, yet various political and socio-economic issues hinder more sustainable economic growth and progress. Nepal's distinct feature of being a landlocked country is also often perceived as an obstacle for industrial growth. Consequently, a large number of workers migrate to the Middle East, India and other countries in search for work and livelihood. In 2012, remittance was the largest source of foreign exchange income, amounting to 25% of GDP.

Nepal's Industrial Policy from 2011 categorises enterprises into various scales (see Table 9.2). Large enterprises are categorised as those with investment over NPR 150 million (USD 1.4 million) including land and buildings. Medium enterprises are those with investment of less than NPR 150 million and over NPR 50 million (USD 0.47 million) including land and buildings. Small-sized enterprises are those with investments less than NPR 50 million including land and buildings. Micro-enterprises are

Table 9.2: Number of enterprises registered by scale (up to financial year (FY) 2012–2013)  
USD 1 = NPR 100 (approximation)

Scale	Number of Enterprises	Total Capital (in Million NPR)	Fixed Capital (in Million NPR)	Working Capital (in Million NPR)	Employment
Large	614	475,319.78	430,863.21	44,456.57	100,729
Medium	1,254	97,767.85	63,899.85	33,868.00	127,648
Small	3,406	45,995.56	27,944.23	18,051.33	229,901
Total	5,274	619,083.19	522,707.29	96,375.90	458,278

Source: Department of Industries [2013].

categorised with investment up to NPR 200,000 (USD 1,900) excluding land and buildings.

### 9.3.1 *Large enterprises in Nepal*

Nepal's large industrial enterprises contribute about 20% to the national GDP. Through its five-year development plans, the country has devised various programmes and policies to emphasise economic growth and promote industrial sectors. The government has prioritised sectors such as agriculture, tourism, energy, telecommunications, and industry (see Table 9.3). Infrastructure is developed within dedicated industrial zones in various parts of the country. The carpet and garment industry is growing rapidly and represents an estimated 70% of the total exports. Nepal's industry needs to produce quality products in order to compete in the international market, which is even more important after joining the World Trade Organisation (WTO). Nepal lags behind in many of its own targets in helping the industry to grow and flourish. The major of industries in Nepal are agro-based, manufacturing, energy or tourism.

### 9.3.2 *Cottage and small-sized enterprises in Nepal*

As Nepal is a rural and agrarian country, cottage- and small-sized enterprises play an important role in the provision of employment and income within

Table 9.3: Number of enterprises registered by category (up to FY 2012–2013) USD 1 = NPR 100 (approximation)

Category	Number of Enterprises	Total Capital (in Million NPR)
Agro-Based	271	13,419.44
Construction	40	6,219.03
Energy-Based	184	269,736.65
Manufacturing	2,319	181,076.15
Mineral	52	4,010.91
Service	957	45,784.74
Tourism	957	45,784.74
Total	5,274	619,083.17

Source: Department of Industries [2013].

society; this is in part due to the relatively low start-up costs requiring less capital and minimal expertise. These enterprises are seen as family businesses where capital is obtained from personal savings and family property. Realising its importance, the government in 1974 set up the DCSI to promote and foster this sector. The intention was to enhance productivity and create a favourable environment for investment, whilst increasing contributions to the national economy. Since then, the government has launched several programmes and projects funded by national budget. Cottage industries are expected to promote indigenous skills, foster traditional industries, and create local employment.

Most of the enterprises are involved in the manufacture of consumer and household goods, textile-related products, and food processing. Activities include weaving, handicrafts, woodcraft, pottery, leatherwork and handmade paper, and the making of noodles, candy, and biscuits. Since many of these goods are for export, Nepal's industrial policy puts a special focus on the micro-, cottage, and small-sized enterprises. This focus includes upskilling and improved access to loans. However, there is a clear need for more enabling environment that promotes the utilisation of local resources and skills. Therefore, to increase the sustainability of this sector, both skills and business capacity are of paramount importance to remain competitive in the international arena. There is also a need to identify new products for export and maintain quality control. Attracting foreign investment and the adoption of modern technology may also contribute to the development of this sector in Nepal.

## **9.4 Policy Perspective on SCP**

Nepal has formulated several national plans and policies to accelerate its socio-economic development. Although it does not have yet a specific policy addressing SCP practice, Nepal is recently making efforts to encourage SCP of goods and services through an environmental legislation. The 2007 interim constitution of Nepal states that every person shall have the right to live in a healthy environment as a fundamental right. It also states that priority shall be given to the prevention of adverse impacts on the environment from physical development activities. Previously Nepal has issued an Environmental Protection Act (1997) that mandates different types of enterprises based on their size and nature to conduct mandatory Initial

Environment Examination (IEE) or Environment Impact Assessments (EIA). The Ministry of Science, Technology and Environment (MoSTE) oversees this via a dedicated division.

The established Industrial Policy has provision to promote sustainable production and consumption through good business practice. One objective states “Establish industrial entrepreneurship as a sustainable and reliable sector by utilising the latest technology and environment friendly production process” [Industrial Policy, 2010]. The policy also highlights the need for enterprises to conduct IEEs and EIAs. It offers support to small and sustainable enterprises that use local resources and are less harmful to the environment and the economy. The National Agriculture Policy (2004) emphasises the conservation, promotion, and utilisation of natural resources and the environment. The provision of environmental protection also exists in other policies and laws such as the Forest Act (1993), Water Resources Act (1993), Tourism Act (1978), Mines and Minerals Rules (2000), and Hydropower Development Policy (2001).

MoSTE has recently started formulating a strategy on low carbon economic development. This is an encouraging step, despite the fact that Nepal has less than one per cent global share in greenhouse gas emissions. Addressing climate change is of huge national interest as it is regarded as one of the most vulnerable countries to its impact. For instance, Himalayan glaciers are melting fast and there is a sharp increase in natural disasters such as landslide and flooding. Adopting SCP principles will contribute to reducing the climate vulnerability of Nepal through forests preservation, sustainable use of natural resources, improved food security, increased income for the poor, reduced negative environmental impact that lower disaster risk, as well as the adoption of low carbon development pathways.

## 9.5 Opportunities and Challenges for SCP

As Nepal is in its early stages of development, there are many opportunities for the country to move ahead in a sustainable and environmental friendly manner from the outset. Nepal can learn from other countries’ experience to not pursue unsustainable development paths. Due to significant damage caused by the 2015 earthquake, Nepal will have to undertake a massive rebuilding process; this can be used as an opportunity to establish eco-friendly

and sustainable policies. In fact there are policies and regulations already in place, which Nepal can further strengthen and implement to be a model for sustainable development. Embracing SCP would support Nepal's target to become a MIC by 2022.

Comparatively speaking, human-induced damage to the environment in Nepal is currently not so high and still relatively easy to mitigate. Urban growth and planning in cities like Kathmandu still lack coherence, which can be corrected given the necessary political will. Recently Nepal is in the process of writing a new constitution and this again provides opportunities to envisage a nation that is more sustainable, responsible, and environmentally conscious.

As Nepal is an economically poor country, sustainable development comes with many challenges. Issues like poverty, food security, sustainable infrastructure, health, and education already pose a huge challenge, not yet to mention the unstable political situation in the country. Nepal still lacks effective implementation and monitoring of the policies supporting SCP and sustainable development. Lack of competent human resources and the ability to bring in modern technology is also a big hindrance. Hence, implementation of policies that support sustainability is a challenge for Nepal.

### **9.5.1 *Agriculture, rural livelihoods, and food consumption***

Agriculture still dominates Nepal's economy and is considered to be the backbone of the country. According to the Ministry of Agriculture Development [MOAD, 2014], 66% of the country's population relies on agriculture for income and employment. Agriculture alone contributes 33% to the national GDP. The Statistical Pocket Book 2010 states that the total agricultural land is 24.97 million hectares of which 6.8% is in the mountains, 40.4% in the hills and 52.9% in the plains. Out of the country's total land area, 27% is arable, forest covers 39.6%, pastures occupy 12%, 17.2% is covered by snow and rocks, and the remaining 2.6% by water [Central Bureau of Statistics, 2010].

In Nepal, paddy, wheat, maize, millet, and potatoes are grown as major food crops. Only a bit later, the government gradually promoted

cash crop farming, such as sugar cane, jute, tobacco, tea, and coffee. The cropping pattern is based on climatic conditions and topography of the country. Farmers still use traditional methods and outdated technology. Nepali farmers lack modern farming techniques, skills, and tools to improve seed varieties and lack adequate knowledge required for commercial agriculture. Due to this, the agricultural production rate is declining and farmers are even struggling to meet their own needs. Migration of youths to urban areas and to the Gulf countries also greatly affects agricultural production. Furthermore, agriculture provides only seasonal employment for rural population, which constitutes 88% of the total population. Hence, off-season and off-farm activities, such as weaving, knitting, basketry, teashops, and roadside shops, complement rural incomes [Ghimire, 2011].

Despite being an agrarian country, Nepal suffers from food insecurity. Multiple factors like low production and lack of access to health services, knowhow, infrastructure, and knowledge in food management make the country vulnerable to food insecurity. The high hills and mountainous regions are particularly susceptible to hunger. According to the World Food Program (WFP), 41% of children under five are stunted, 29% are underweight and 11% are classified as wasted. The prevalence of stunting in the hills and mountains of the mid and far western regions is extreme with rates above 60% [World Food Program, 2015]. Nepal is not in a position to match agriculture production with that of population growth. Furthermore, frequent natural disasters saddle the already poor population. According to the Food and Agriculture Organisation [FAO, 2014], despite a declining trend over the last decade, 4.5 million Nepali people are still undernourished (see Tables 9.4 and 9.5).

Agriculture is one of the sectors where SCP can be promoted in Nepal. Different from the industrialised countries, sustainable food consumption in Nepal requires *increasing* consumption rates and calorie intake to overcome undernourishment. National agriculture policy places an emphasis on the conservation, promotion, and utilisation of natural resources and the environment to minimise the negative impact of modern agriculture practices. The policy also motivates farmers to continue organic farming and support biodiversity. With the awareness level rising among citizens against the use of inorganic chemicals, a movement

Table 9.4: Nepal per capita food supply

	Quantity [kcal/capacity/day]			
Year	1996	2001	2006	2011
Food Supply	2,220	2,281	2,400	2,580

Source: FAO [2014].

Table 9.5: Prevalence of undernutrition in Nepal

	Prevalence (%)			
Year	1999–2001	2004–2006	2007–2009	2010–2012
Undernutrition	25	22	20	18

Source: FAO [2014].

towards organic agriculture and products is increasing. As the majority of Nepal's agricultural products are from traditional farming methods, imbedding SCP practice is feasible.

## 9.6 Forestry Sector

Forest is an important natural resource, which is managed by the Ministry of Forests and Soil Conservation (MFSC). Communities, international donors, and civil society organisations also play a crucial role in managing the forests. According to the Government of Nepal, forests cover 39.6% of the country, which is about 5.83 million hectares. This constitutes 29% of dense forest and the remainder shrub habitat. The Forest Act identifies two primary kinds of forest — national forest and private forest. It has further categorised national forest into five secondary types: Government Managed, Community Managed, Protected Forests, Leasehold Forest, and Religious Forest. Many rural and agriculture dependent populations rely heavily on forest for fuel, fodder, and agricultural activities. According to an MFSC report, forestry contributed 9.5% of GDP in 2008 with its direct products and 27.5% through its environmental services. Community-managed forest is hugely successful in the mid hills of Nepal. The Department of Forests (DoF) reports that 17,685 Community Forest User Groups (CFUGs) consisting of 1.45 million households or 35% of the population are

involved in the community forestry management programme, managing about 1.65 million ha of forest to date. Under the community forestry management programme, members of community who have rights over the nearby public areas of forest can form a group. This group manages the entire forest, plants trees, saves it from fire, and shares the forest products and benefits. Apart from the increasing forest cover, the community forestry management programme has helped rural people increase their income and expand forest-based enterprises. The programme has helped increase greenery and biodiversity, and restored degraded forestland, and in return has served communities by supplying forest products and improving livelihoods.

According to Department of Forests [2015], between 1990 and 2005, Nepal lost 42,000 ha of its primary forest cover. The forest cover loss in the plains (Terai) alone from 1991 to 2010 was found to be about 32,000 ha. The annual rate of decrease in forest cover was 0.44% and 0.40% during the periods of 2001–2010 and 1991–2010 respectively. However, despite the issue of deforestation, a recent study by MFSC revealed that the rate of forest cover was slightly increasing at an annual rate of 0.06% during 1990–1991 to 2000–2001. The community forestry intervention has significantly improved Nepal's forest coverage. An example of sustainable forest in Nepal practice is demonstrated by the SWITCH-Asia project, which promoted Lokta handmade paper (see Box 9.1).

### **Box 9.1 SWITCH-Asia Case Study: Enhancement of Sustainable Production of Lokta Handmade Paper Production in Nepal**

The SWITCH-Asia project, “Lokta Handmade Paper” aimed at addressing social and environmental issues related to the handmade paper sector in Nepal. The process of preparing handmade paper from a plant, *lokta*, is very popular in Nepal. Lokta (*Daphne bhoula* or *Daphne papyracea*) is an indigenous plant of Nepal, found at an altitude ranging from 4,500 feet to 10,000 feet. There are over 170 enterprises employing thousands of rural people to produce such paper. Lokta handmade paper has been a good source of income generation for poor people, especially women. For many, the sector also provides an additional revenue stream, which they make during their free time.

(Continued)



**Box 9.1 (Continued)**

During the project implementation from 2009 to 2011, various activities were implemented including training for the makers of lokta paper, especially in sustainably harvesting and forest management. Altogether, 1,195 lokta cutters and 727 paper makers have benefited from the training. Through a training of trainers programme, the project prepared a pool of local trainers who were equipped with knowledge and skills to implement SCP in the lokta paper industry. Thirty entrepreneurs were trained to reuse wastewater and help reduce environmental pollution. They also learnt to prepare lokta paper in a sustainable manner and how to market the green products.

The project sought to provide additional benefits by preparing guidelines for lokta plant cutters and paper makers, similarly, codes of conduct for the lokta entrepreneurs. The project promoted cost minimisation among paper producers and entrepreneurs through reduced consumption of fuel wood, paper drying, and water whilst maintaining the quality of end product. The project also provided many stakeholders with exposure visits and networking opportunities with national and international entrepreneurs. Overall, the project has helped build capacity among lokta cutters, entrepreneurs and its association, and develop more sustainable and environment friendly practice.

**9.7 Tourism Sector**

Tourism is one of the largest industrial sectors in Nepal that contributes to the economic development. It is the country's main foreign exchange earner, creates jobs, provides an economic alternative to the people of both rural and urban settings, and generates revenue. According to World Travel and Tourism Council [WTTC, 2014], in 2013 travel and tourism directly supported 504,000 jobs, which is 3.2% of total employment. In a country where unemployment rate is about 45%, this sector indeed has something to offer to the unemployed. In 2013, tourism has direct contribution of 3.9% of GDP. The major attractions of tourism in Nepal are mountaineering, adventure, and eco-tourism. Tourists come from all over the world, but the top five countries are India, China, US, Sri Lanka, and UK. Besides nature, Nepal is attractive for tourists because of its cultural, traditional, and religious aspects. To support the tourism sector, the Government of Nepal had organised tourism promotion programmes such as "Nepal Tourism Year 2011," "Visit Lumbini Year 2012," and "Everest Diamond

Jubilee 2013.” However, Nepal continues to face multiple problems in the tourism sector due to its political instability, low product diversity, and seasonality. Since the 2015 earthquake, tourist numbers dropped by around 80%, jeopardising the entire sector [Deccan Chronicle, 2015]. Instilling SCP in the tourism sector is therefore imperative, so Nepal may continue generating revenues the long run. The SWITCH-Asia project, SEID, can be an example of how a sustainable and efficient industrial development supports tourism sector (see Box 9.2).

### **Box 9.2 SWITCH-Asia Case Study: Sustainable and Efficient Industrial Development in Nepal and Bhutan (SEID)**

The SWITCH-Asia Programme has supported a bi-country project which was implemented in Nepal and Bhutan from early 2012 to November 2015. The project sought to contribute to the sustainable development of economy with a focus on national industrial sectors impacting the environment and which have a huge potential for employment generation and poverty alleviation. This was, among others, achieved by reducing operational costs and pollution, and improving health and safety measures in the tourism and agro-based sectors. The project stakeholders included SMEs, workers, experts, government authorities, and policy makers.

To meet its objectives, the project conducted training to enhance SMEs’ capacity, promoted resource and energy efficiency, built networks, and mainstreamed relevant policies. In Nepal, the project focused more on tourism sector. An awareness campaign and in-house training were organised for business associations, whilst exchange of best practice was also encouraged to enhance national and international learning. The project provided knowledge and skills to more than 40 local consultants as well as representatives from industry and academia through a series of training sessions. The project worked with about 200 micro-, small-, and medium-sized enterprises (MSMEs) helping them to acquire skills, making them environmentally sensitive, and building knowledge on managing wastewater. Global best practice was also introduced to local companies and institutions, which resulted in the establishment of new academic curricula and Green Eco Clubs at colleges. The students from the Eco Club then acted as social agents to promote environmental protection and raise public awareness.

To mainstream SCP practice, the project has worked with the Federation of Nepal Cottage and Small Industries (FNCSI), Nepal Tourism Board (NTB),

*(Continued)*

**Box 9.2 (Continued)**

Sustainable Tourism Network of Nepal, and Hotel Association of Nepal (HAN). The objective was to bring about behavioural changes among the entrepreneurs. SEID project has helped MSMEs generate financial savings of around 10–15% through an enhanced efficiency in the production and operation. This has led to a reduced energy consumption by 10–25%. Similarly, the use of hazardous materials such as pesticides and inorganic fertilizers used in the production was reduced by 50%, whilst the practice of managing waste, pollution and water has improved the living environment around the MSMEs.

**9.8 Renewable Energy Sector**

Hydropower is the major source of energy in Nepal with a huge potential to generate electricity of approximately 40,000 MW. However, it has only managed to develop around 600 MW [IPPAN, 2011]. Until 1990, hydropower development was under the domain of the state-run Nepal Electricity Authority (NEA). However, in 1992 the government enacted a new Hydropower Development Policy to open up the sector to private operators. Since then private entities have commissioned several hydropower projects, which contributed about 148 MW of power to the national grid. In Nepal, 44% of the energy is used by domestic sector, while 37% and 8% is used by the industrial and commercial sectors respectively.

Nepal faces acute energy shortages. Although only 70% of the population has access to energy, a shortfall of about 40% results in severe power cuts (see Table 9.6). With the 2015 earthquake, the situation has worsened with 14 hydropower projects were damaged out of the 23 in operation, according to the Nepal Economic Forum. This is a loss of 150 MW of power. These situations make people in rural areas continue to rely on forest products, kerosene and biogas for cooking and lighting. In order to address this problem, Nepal is currently prioritising an energy mix model by investing in various renewable energy sources.

In 2012, Nepal launched a five-year programme called the National Rural and Renewable Energy Programme (NRREP) with the objective to improve the living standard of rural people and reduce dependency on traditional energy. The targets of this programme include producing

Table 9.6: Nepal energy demand–supply gap

Energy Gap (2011 Figures)	
Annual Peak Demand	946.10 MW
Dry Season Generation	450 MW
Deficit (Gap)	500 MW
Annual Total Energy Demand	4,833.35 GWh
Generated Energy from Available Source	3,850.87 GWh
Yearly Energy Gap	982.48 GWh (20.33%)

Source: HIDCL [2013].

Table 9.7: Installed renewable energy technology in Nepal (Until July 2011)

Renewable Energy Technology		Total Installation		Unit	District Covered
		No.	Capacity		
1	Hydropower	40	14.95	MW	31
	Mini hydropower	999	18.65	MW	59
	Micro hydropower	1,480	3.18	MW	53
	IWM	7,959	—	—	46
2	Biogas				
	Household plant	258,642	—	—	72
	Institutional plant	111	—	—	25
	Community plant	61	—	—	20
3	Solar				
	HH Solar PV	284,097	7.44	MW	74
	Institution Solar PV — for computers, FM radios and Vaccine refrigerators	299	—	—	42
	Solar Pumps	81	—	—	22
	Solar cookers/dryers	1,920	—	—	30
	Small Solar Home System	11,687	0.05	MW	49
4	Biomass				
	ICS	619,816	—	—	52
5	Wind	21	—	—	12

Source: AEPC [2011].

25,000 kW of energy from mini and micro hydropower and distributing 600,000 solar photovoltaic systems and 475,000 improved cook stoves for rural villagers (see Table 9.7). According to NEA, energy demand is increasing and is likely to grow at an average annual rate of 8.34%.

Nepal's energy is largely green and renewable. However, with the growing focus on building mega hydropower, producing this green energy may not necessarily be sustainable and environment friendly. Therefore, it is mandatory to undertake an EIA before constructing large-scale hydropower schemes. Nepal's hydropower policy has actually stringent environmental protection safeguards during the development of any scheme. However, provisions in the policies to protect the environment are much weaker, though the government has allocated substantial resources for small-scale renewable energy sources and been launching programmes in rural areas. The SWITCH-Asia Bio-energy project provides an example of the implementation of SCP in energy sector (see Box 9.3).

### **Box 9.3 SWITCH-Asia Case Study: Bio-energy Project**

The SWITCH-Asia Programme is supporting a project in Nepal with the aim to contribute to the national goal of poverty reduction through upscaling the production and industrial consumption of bio-energy, thereby increasing employment and reducing carbon emissions. Energy demand is increasing in Nepal for both industrial and domestic purposes. Though rich in hydropower, the country has not been able to supply adequate energy; hence, many rely on diesel generators for household energy. Therefore, this Bio-energy Project is designed to meet the increasing energy demand by replacing fossil fuels with locally-produced charcoal that helps to reduce carbon emissions. Though developed countries are the largest consumers of fossil fuels and developing countries like Nepal have low carbon footprints, choosing the right path from the onset will help to contribute in addressing climate change. This project helps create local employment for poor people by engaging them in the collection of biomass residue from forests and charcoal production and marketing.

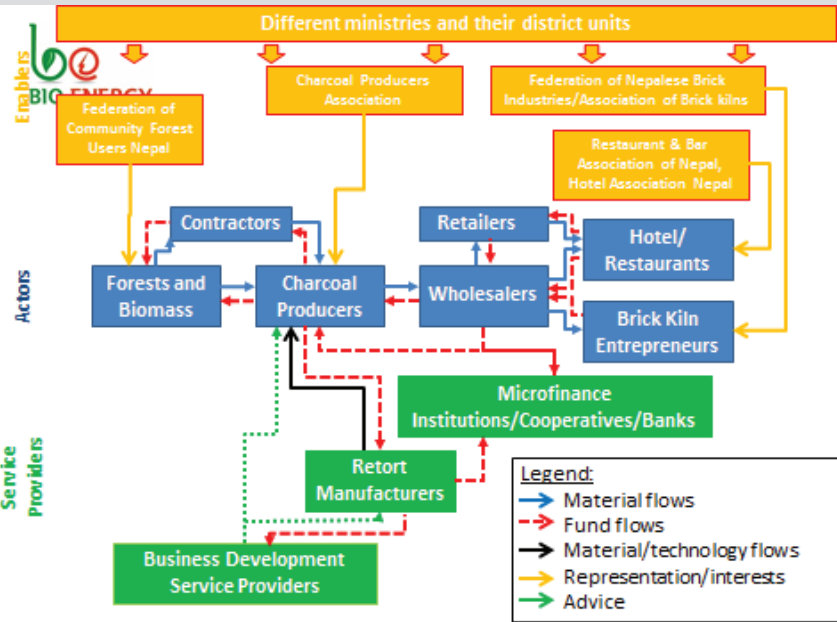
Being implemented in 16 districts of Nepal, the project aims to increase the production and processing capacity of bio-energy enterprises. Over 10,000 local jobs are planned to be created where charcoal will be produced by sustainably harvesting forest products as part of forest management. Through the project's intervention, the capacity of SMEs will be enhanced and income

*(Continued)*

Box 9.3 (Continued)

increased. The project also aspires to reduce 74,000 tonnes of CO<sub>2</sub> by replacing fossil fuel consumption with charcoal. To create sufficient demand, the project helps SMEs to market charcoal to local hotels, restaurants, and brick industries. The project contributes to establishing the value chain by strengthening network among SMEs and increasing local business through a sustainable production and consumption of charcoal.

Various project activities are planned, where local entrepreneurs and businesses are supported to make a business plan and operate bio-energy projects. The project helps establish links between the SMEs and financial institutions for potential financing. SMEs are also trained on and equipped with the appropriate technology to increase their production. Information and learning exchange will expand the SMEs' activities and shift use from fossil fuels to bio-energy. Training and capacity building conducted stakeholders will ensure cordial relations between charcoal producers and consumers.



Source: SWITCH-Asia Bio-energy Project.

(Continued)

### Box 9.3 (Continued)

In 2014, 14 Business Development Service Providers benefitted from procurement contracts. Another 29 Business Development Service Providers had been trained in entrepreneurship skills and business planning, so they can provide training and consultation to SMEs. Also, 43 new charcoal enterprises had been established in 2014. This initiative will not only help increase the income of the target groups, but also contribute to environmental protection. In its nascent stages, the project has yet to have concrete results. However, there are good signs as one SME already produces around 10 tonnes of charcoal.

## 9.9 Conclusions

Nepal still lacks a single and coherent policy that promotes and protects SCP practice. However, the prospect looks promising when the available policies, laws and strategies supporting sustainable development are gathered for a more synchronised implementation. These instruments serve as the building blocks for a successful SCP implementation. Lack of skilled human resources as well as low awareness of and insufficient incentives to adopt SCP practice have hindered its implementation in Nepal. The low level of policy monitoring and implementation is also a major hurdle. The government will need to ensure an effective implementation of its policies. Many encouraging steps have already been taken in sectors like renewable energy, agriculture (the use of organic fertilizers and reduction in the use of harmful chemicals), air quality, sustainable tourism, waste management, and forest and environment conservation. These are progresses that Nepal can build upon, while moving towards a low carbon economic development. If this can be realised, Nepal will enjoy a sustainable development, which at the same time help tackle the issue of climate change. The SCP concept is relatively new in Nepal with industrialisation just taking its first steps. The industries and entrepreneurs will have to be aware of and then embrace the SCP principle seriously. There will need to be significant international assistance in terms of awareness, skills, knowledge, access to finance and technology. However, there is also a vibrant civil society and media in the country that can advocate and promote this principle.

Acceptance of SCP principle will not come without challenges. There is a huge pressure on the government to deliver socio-economic development and to pull people out of poverty. It will also need to meet the demands of gradually incubating businesses and industries in the country. Lack of adequate infrastructure, energy, and an enabling environment for industry is considered to be a big setback for the economy. In this context, SCP will have to be pitched as an approach that will address poverty, meet the basic needs of the people and protect the environment all at the same time. The government will also have to strengthen existing policies or formulate new ones through a participatory process and then enforce them. In the present context, the SWITCH-Asia Programme is financing projects under diverse areas to promote SCP concept. This is a positive and timely start to lead by example. The success of these grant projects can further motivate the government and other stakeholders to adopt SCP practice. In the future, the SWITCH-Asia Programme could launch more projects that target strategic issues in Nepal such as air and water pollution, low-carbon development, pesticide and inorganic fertiliser management, waste management, and organic agriculture, which will concurrently promoting sustainable production and consumption. Overall, specific policy influence at national level to promote SCP would be a crucial forward step for Nepal. The SWITCH-Asia Programme could help promote these policies through facilitating the exchange of lessons learnt from other countries' good practice. Learning, sharing and networking could be promoted among like-minded stakeholders within the country and beyond.

## References

- Alternative Energy Promotion Centre (AEPC) (2011). *Summary of Installed RETs in Nepal (Till July 2011)*. [online] Retrieved on October 19, 2015. Available on: [http://www.aepc.gov.np/?option=statistics&page=natstats&mid=6&sub\\_id=45&id=1](http://www.aepc.gov.np/?option=statistics&page=natstats&mid=6&sub_id=45&id=1).
- Deshar, B. D. (2013). *Global Journal of Economics and Social Develop* 3, 1.
- Bhatta, G. R. (2014). Structural changes in a small and open economy: Evidences from Nepal. *NRB Working Paper* No 23. Nepal Rastra Bank, Kathmandu, Nepal.



- Central Bureau of Statistics (2010). *Statistical Pocket Book 2010*. Thapathali, Kathmandu, Nepal.
- Deccan Chronicle (2015). *Nepal's Tourism Industry in Jeopardy, 80 per cent Tourists Cancel Trip to Quake-Hit Country: Report*. 5 May 2015. Retrieved on October 19, 2015. Available on: <http://www.deccanchronicle.com/150505/world-neighbours/article/nepal%E2%80%99s-tourism-industry-jeopardy-80-cent-tourists-cancel-trip-quake>.
- Department of Forests (2015). *Community Forestry*. Retrieved on July 26, 2015. Available on: [http://dof.gov.np/dof\\_community\\_forest\\_division/community\\_forestry\\_dof](http://dof.gov.np/dof_community_forest_division/community_forestry_dof).
- Department of Industries (2014). *Industrial Statistics, Fiscal Year 2012/2013*. Kathmandu, Nepal. Available on: [http://doind.gov.np/documents/pdf/industrial\\_statistics\\_2069\\_70.pdf](http://doind.gov.np/documents/pdf/industrial_statistics_2069_70.pdf).
- Food and Agriculture Organisation (FAO) (2014). *FAOSTAT Nepal*. Retrieved on July 24, 2015. Available on: [http://faostat.fao.org/CountryProfiles/Country\\_Profile/Direct.aspx?lang=en&area=149](http://faostat.fao.org/CountryProfiles/Country_Profile/Direct.aspx?lang=en&area=149).
- FRA/DFRS (2014). *Terai Forests of Nepal (2010–2012), Forest Resource Assessment Nepal Project/Department of Forest Research and Survey*. Kathmandu, Babarmahal. Available on: [http://www.franepal.org/wp-content/uploads/downloads/publications/TeraiForestsOfNepal\\_23April2014\\_LowResolution.pdf](http://www.franepal.org/wp-content/uploads/downloads/publications/TeraiForestsOfNepal_23April2014_LowResolution.pdf).
- Ghimire, R. (2011). Micro and small enterprises in Nepal: Prospects and challenges. *Journal of Finance and Management Review*. March 2011, 2(2). Available on: [http://www.academia.edu/5589600/Micro\\_and\\_Small\\_Enterprises\\_in\\_Nepal\\_Prospects\\_and\\_Challenges](http://www.academia.edu/5589600/Micro_and_Small_Enterprises_in_Nepal_Prospects_and_Challenges).
- Government of Nepal (2010). *Industrial Policy*. Kathmandu, Nepal.
- Government of Nepal (2004). *National Agriculture Policy*. Kathmandu, Nepal.
- Government of Nepal (2001). *The Hydropower Development Policy*. Singhadurbar, Kathmandu, Nepal. Available on [http://www.nea.org.np/images/supportive\\_docs/hydropower\\_development\\_policy\\_2001.pdf](http://www.nea.org.np/images/supportive_docs/hydropower_development_policy_2001.pdf).
- Government of Nepal (1997). *Environment Protection Act*. Kathmandu, Nepal.
- Hydroelectricity Investment & Development Company Limited (HIDCL) (2013). *Nepal Hydropower Overview*. Retrieved July 23, 2015. Available on: <http://www.hidcl.org.np/nepal-hydropower.php>.
- Independent Power Producers Association Nepal (IPPAN) (2011). *Hydropower in Nepal*. Retrieved on July 19, 2015. Available on: <http://www.ippan.org.np/HPinNepal.html>.

- Institute for Integrated Development Studies (2014). *Nepal Economic Outlook - 2013/14, Summary Report*. Kathmandu, Nepal. Available on: <http://iids.org.np/wp-content/uploads/2014/07/Economic-Outlook-2013-14-Summary-Report.pdf>.
- Katmandu University (2009). *Journal of Science, Engineering and Technology*. 5(II). Available on: [http://www.ku.edu.np/kuset/vol5\\_no2/17\\_Ramesh\\_EIA%20Article%20Revised%20Final.pdf](http://www.ku.edu.np/kuset/vol5_no2/17_Ramesh_EIA%20Article%20Revised%20Final.pdf).
- Ministry of Agricultural Development (MOAD) (2014). *Statistical Information on Nepalese Agriculture 2013/2014*. December 2014. Retrieved on July 20, 2015. Available on: <http://www.moad.gov.np/uploads/files/Year%20book%202014.pdf>.
- Ministry of Finance (MoF) (2015). *Nepal Aid Management Platform*. Retrieved on July 26, 2015. Available on: <http://amis.mof.gov.np/portal/>.
- Ministry of Finance (MoF) (2013). *Foreign Aid in Nepal*. March 2013. Retrieved on July 26, 2015. Available on: [http://www.mof.gov.np/uploads/document/file/second\(1\)\\_20130715031659\\_20130813114805.pdf](http://www.mof.gov.np/uploads/document/file/second(1)_20130715031659_20130813114805.pdf).
- NepalTourNews.com (2015). *Tourist arrivals by air decreased in 2014*. 12 March, 2015. Retrieved on October 19, 2015. Available on: <http://www.nepaltournews.com/news/14-nepal-news/42-tourist-arrivals-by-air-decreased-in-2014>.
- 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/>.
- UNESCO (2015). *Family Literacy Programme*. Country Profile: Nepal. Retrieved on October 16, 2015. Available on: <http://www.unesco.org/ui/litbase/?menu=14&programme=206>.
- UNHCR (2015). *Nepal: 2015 Earthquakes*. Retrieved on August 13, 2015. Available on: <http://data.unhcr.org/nepal/>.
- Worldatlas (2015). *Nepal Geo Statistics*. Retrieved on October 19, 2015. Available on: <http://www.worldatlas.com/webimage/countrys/asia/nepal/nplandst.htm>.
- World Bank (2015a). *Nepal Country Data*. Last updated 19 June 2015. Retrieved on October 16, 2015. Available on: <http://www.worldbank.org/en/country/nepal>.
- World Bank (2015b). *Nepal Overview*. Retrieved on August 13, 2015. Available on: [www.worldbank.org/en/country/nepal/overview](http://www.worldbank.org/en/country/nepal/overview).
- World Food Program (2015). *What are the Current Issues in Nepal*. Retrieved on October 16, 2015. Available on: <https://www.wfp.org/countries/nepal>.
- World Travel & Tourism Council (WTTC) (2014). *Travel and Tourism, Economic Impact 2014, Nepal*. Available on: <http://www.wttc.org//media/files/reports/economic%20impact%20research/country%20reports/nepal2014.pdf>.