



**Republic of Mauritius**

**MINISTRY OF SOCIAL SECURITY, NATIONAL SOLIDARITY, AND  
ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**

## **COUNTRY IMPLEMENTATION PLAN**

# **SWITCH AFRICA GREEN**

**October 2016**



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## **Acknowledgements**

The Ministry of Social Security, National Solidarity, and Environment and Sustainable Development would like to express its appreciation to the European Union, UNDP Country Office, UNEP, UNOPS and also to all Ministries and Organisations which have contributed to the preparation of this report.

## Acronyms

AFD:	Agence Francaise de Developpement
CEB:	Central Electricity Board
CWA:	Central Water Authority
DRR:	Disaster Risk Reduction
EEMO :	Energy Efficiency Management Office
EFR:	Environmental Fiscal Reform
EPA:	Environment Protection Act
FAREI :	Food and Agricultural Research and Extension Institute
FDI:	Foreign Direct Investment
FIT:	Feed-in-Tariffs
GDP:	Gross Domestic Product
GHG:	Greenhouse Gas
ICT:	Information and Communication Technology
IPPs:	Independent Power Producers
ITC:	International Trade Centre
LNG:	Liquefied Natural Gas
LPG:	Liquefied Petroleum Gas
MAIFS:	Ministry of Agro-Industry and Food Security
MARENA:	Mauritius Renewable Energy Agency
MCA:	Mauritius Chamber of Agriculture
MEPU:	Ministry of Energy and Public Utilities
MID:	Maurice Ile Durable
MIDPSAP:	MID Policy, Strategy and Action Plan
MoESD:	Mnistry of Environment and Sustainable Development
MoESDDBM:	Ministry of Environment, Sustainable Development, Disaster and Beach Management
MOFED:	Ministry of Finance and Economic Development
NEAP:	National Environmental Strategy and Action Plan
NGO:	Non-Governmental Organization
PAGE:	Partnership for Action on Green Economy
PMO:	Prime Minister's Office
PV:	Photo Voltaic
R&D:	Research and Development
RE:	Renewable Energy
REE:	Recurrent Environmental Expenditure
RM:	Resource Mobilization
SAG:	Switch Africa Green
SCE:	Senior Chief Executive
SCP:	Sustainable Consumption and Production
SIDPR:	Sustainable Integrated Development Plan for Rodrigues
SIDS:	Small Island Development States
SSDG:	Small Scale Distribution Generation
SWH:	Solar Water Heater
TVET:	Technical and Vocational Education and Training
UN:	United Nations
UNFCCC:	United Nations Framework Conference on Climate Change
VAT:	Value Added Tax
UNCCD:	United Nations Convention to Combat Desertification
WMA:	Wastewater Management Authority

## Executive Summary

With a view to catalysing the implementation of Sustainable Consumption and Production (SCP) at national level and enhancing the integration of SCP at the regional level, the European Union developed the SWITCH Africa Green (SAG) Programme. This programme is implemented by UNEP, UNOPS and UNDP in 6 pilot African countries including Mauritius. This Country Inception Report details the findings of the policy support component for the Republic of Mauritius, including Rodrigues, with regard to the identified priority sectors namely: Agriculture, Manufacturing, and Tourism, with Energy, Water, Eco Innovation, Eco Labelling and Sustainable Trade as cross-cutting issues.

The current business environment, challenges and opportunities, policy recommendations and country projects have been derived from desk research, consultations with key stakeholders and cluster group meetings followed by consultative and validation workshops.

The study shows that the 3 priority sectors for Mauritius and Rodrigues are all vulnerable and present serious challenges for Micro, Small and Medium Enterprises (MSMEs). This situation will remain unchanged, unless a combination of policy, legal and regulatory changes creates the enabling conditions for entrepreneurs to compete sustainably. The main cross-cutting issues which require attention are eco-innovation, sustainable trade and eco-labelling followed by water and energy. The gaps result from support institution weaknesses, weak supply chain power of MSMEs, and deficiencies leading to an inability to tap emerging markets for sustainable products.

The policy recommendations and country projects identified show that owing to the small size, vulnerability and isolation of an island economy, a high level of inter and intra sectorial linkages is required to achieve sustainability. This requirement is particularly critical for Rodrigues, which, as an outer small island, is very vulnerable.

The country projects in agriculture aim at closing the loop between livestock and food crops activities in terms of optimal nutrient recycling, while also establishing eco-labelling and providing for a more efficient and fair supply chain to generate better returns for small holders commercial farmers condemned to fail, in their current situation, in the short to medium term.

In the manufacturing sector, due to weaknesses in support institutions and access to finance, innovative and short term solutions have been proposed for MSMEs to access expertise, capital and funding to address the critical barriers to green growth.

In the tourism sector, it was found that MSMEs can benefit from a stronger country branding and the development of local tourist destinations. There is also the need to carry out a Sustainable Carrying Capacity study which will lead to an informed policy formulation and a national tourism strategy for the MSME operators to operate sustainably in the context of a globally competitive tourism sector. The core concepts proposed for Mauritius are also valid for Rodrigues but with country projects which respond to the specificities of Rodrigues.

The policy recommendations and country projects have been grouped around 5 thematic areas for Mauritius and 4 thematic areas for Rodrigues. A log frame format has been developed to document the main outcomes and outputs of the country projects as well as risks, assumptions, institutions involved, estimated budgets, and linkages to national policy.

Three types of funding requirements have been identified aiming at short term outcomes through consultancy and training, implementation of demonstration and pilot projects and detailed project development for country-wide and long-term projects, respectively. The need for research and in depth modelling of triple bottom line benefits has been highlighted as a means to attract funding from impact investors and emerging sources of green funding, particularly for large scale and long-term projects.

The requirements for two levels of monitoring and evaluation have been documented. At the implementing agency level, it is proposed to use the project management methodology to track progress of implementation to remain within budget and schedule. At the country level, there is a need to establish the linkages between the SAG country projects, the SDGs, the action plan to implement Vision 2030 and the Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway. One proposed approach is to customize the Vulnerability Resilience Country Profile (VRCP) Framework as a planning and monitoring tool for SAG country projects and other initiatives under the Mauritius Action Plan.

## 1.0. Introduction and Background

- With a view to catalysing implementation of SCP and greening the economy at national level and enhancing the integration of SCP at the regional level, the European Union developed the SWITCH Africa Green Programme with the collaboration of UNEP, UNOPS and UNDP. This programme aims at supporting African countries to achieve sustainable development by promoting development of green businesses and eco-entrepreneurship, based on the adoption of SCP practices.
- This will be achieved through support to the private sector, more specifically to Micro Small and Medium Enterprises (MSMEs), to better equip them to seize the opportunities for green business development. The Switch Africa Green programme will also assist the pilot countries to develop enabling conditions in the form of clear policies, more appropriate regulatory frameworks, economic incentives and market-based instruments, to enhance their capacities to transition to a green economy. Identified priority sectors for the Republic of Mauritius are the Manufacturing, Tourism and Agricultural sectors, and Energy, Water, Eco Innovation, Eco Labelling and Sustainable trade as cross-cutting issues.
- Implementation of the SWITCH Africa Green Programme comprises 3 components: Policy Support to review existing policies of key sectors and identify opportunities for promoting SCP and green economy; Green Business Development to integrate resource efficiency and SCP practices in businesses; and Networking Facility to enable dissemination and replication of good practices. The focus of this report is on Policy Support for Mauritius.
- In 2010, Sustainable Development was included in the mandate of the Ministry of Environment, Sustainable Development, and Disaster and Beach Management (MoESDDBM) and this was followed by required changes in the institutional set up and by capacity building initiatives.
- Mauritius has shown commitment to green its economy through SCP practices by developing its own National Programme on SCP in 2008. The main objective of this national framework was to mainstream sustainability principles in priority areas through resource efficiency and adoption of sustainable practices, education and sustainable lifestyles.
- The recommendation of the 2012 United Nations Conference on Sustainable Development to have a 10-Year Framework of Programmes (10 YFP) on SCP and the dedication of one of the Sustainable Development Goals (SDGs) to promote Sustainable Consumption and Production (Goal 12) are clear indications that shifting to sustainable consumption and production patterns is central to achieving sustainable development.
- Transitioning to more sustainable pathways entails a reconfiguration of the structure for production, distribution and consumption of goods and services through reviewing existing policies so as to develop more appropriate regulatory frameworks, economic incentives, and innovative business ventures which will promote a green and inclusive business environment in the Republic of Mauritius.



- The objectives of this consultancy are to:
  - (i) carry out a policy review, analyze gaps and challenges that are acting as barriers for the greening of MSMEs and identify opportunities to support green business development in Mauritius in the three identified sectors of the SWITCH Africa Green project; and
  - (ii) formulate a Country Implementation Plan for the implementation of the recommendations to enhance green business development.

## 2.0 Methodology and Data acquired

### Step 1: Data and knowledge acquisition

- Review of existing reports, policies, business environment, incentive framework.
  - The sources of information have been compiled from the parent Ministries of the target sectors - Agriculture, Manufacturing, Tourism, with Energy as a cross-cutting issue - and from Rodrigues. The published and undocumented reports from Government departments, private sector organizations (Business Mauritius, Mauritius Chamber of Agriculture) and UN bodies (UNDP, UNEP) have been collected and studied.
- One to one meetings with key public and private sector stakeholders.
  - One to one meetings have been organized with key stakeholders to obtain their views about policies, strategies, incentives, barriers and actions to ‘switch’ to green.
- Interaction with SMEs and beneficiary institutions and Grantees under Component B of SAG.
  - Another source of information was the participation in the National stakeholders’ Workshop where interaction with beneficiaries of grants provided empirical feedback on ongoing projects and their perspective of the Switch Africa Green project.
- Benchmarking policies and practices with other SAG countries.
  - Since the policy support component for Mauritius was initiated after the completion of the exercise for South Africa, Ghana and Uganda, the reports from these countries have provided a useful perspective on lessons learnt or experiences which can be adapted to the Mauritian context.

### Step 2: Analysis of gaps and weaknesses in policy, legal and regulatory frameworks; business environment, and incentive frameworks for switching to green

- Contextualization of the focus of policy interventions for 3 target sectors along the Environmental, Economic and Social dimensions of sustainability.
  - The sustainable development debate is new to the 3 target sectors for both policy makers and industry operators. In some cases, the full scope for switching to green may not have been captured in the existing policies. In other cases, there may be a need to clarify definitions to align all parties to a shared understanding.
- Identification of gaps to meet the high-level declared targets or potential optimal targets.
  - The gaps will be identified in the form of challenges and opportunities in each sector to meet the declared and potential green targets.
  - Gaps in data availability, capacity building and training needs and in-depth research areas will be identified in the light of the requirements for switching to green alternatives .
- Identification of focus areas of intervention to bridge the gaps to meet the high-level declared targets or potential optimal targets.

- The high-level policies will be confronted to policy, regulatory and operational barriers for implementation and empirical feedback from the ground and relevant recommendations will be proposed in the inception plan.

### **Step 3: Policy recommendations and Country Implementation Plan**

- Recommendation on changes in policy, legal and regulatory frameworks, incentive schemes, to switch sectors to green.
- Estimation of the potential impact of recommendations and country projects.

The solutions proposed will then be integrated in a coherent Country Implementation Plan which will build on existing structures, and projects to develop specific initiatives focused on sustainability.

- Development of the Country Implementation Plan, Organisation, Monitoring and Review Mechanisms, Log-Frames and Schedule.

## **3.0 The Mauritian Scenario**

### **3.1 Mauritius Sustainable Development Framework**

- The Maurice Ile Durable (MID) concept was launched in 2008 and initially focused on development of renewable energies. The concept was then expanded to include the pillars of sustainable development known as the five E's: Education, Environment, Energy, Employment/Economy and Equity leading to the MID Policy Strategy and Action Plan (MID PSAP) in 2011. Working groups, including all major stakeholders, were set up for each area and a series of national consultations were held to develop the PSAP in a participatory manner in accordance with good governance principles.

### **3.2 Green Jobs Mauritius**

- The 2012 United Nations Conference on Sustainable Development (Rio+20) has raised awareness on the impact of enterprises and the people that manage their operations, on the level of emissions, the use of resources and the degree of pollution. This had led to the concept of greening the economy and green jobs that focus on the social dimension of sustainable development and on the creation of opportunities for decent work.
- The International Labour Organisation (ILO) created the Green Jobs Programme to assist member countries to better understand the employment and social opportunities and challenges in the evolving green economy and those related to the effects of climate change. In 2011 and 2012, the ILO provided support to the Government of Mauritius on the employment dimension of sustainable development and recommended an operational link between jobs, skills, and enterprise development – Green Jobs in Mauritius: Experiences from a Small Island Developing State, ILO 2013.

### **3.3 Green Economy Mauritius**

- UNEP defines a green economy as one that results in improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities. For Mauritius, this would mean an economy whose growth in income and employment is driven by public and private investment that reduces carbon emissions and pollution, enhances energy and resource efficiency and prevents the loss of biodiversity and ecosystem services, whilst creating green jobs.
- The Green Economy (GE) Assessment report was undertaken by the University of Mauritius in partnership with UNEP (2015). It consisted of a macroeconomic modelling exercise to understand how Government policies, coupled with both public and private investment, can achieve the objectives of income growth, economic diversification and job creation, while contributing to social equity and environmental improvement.
- Through a multi-stakeholder consultation workshop in 2013, local actors identified seven sectors for transitioning towards a green economy, namely: agriculture, energy, waste, water, tourism, manufacturing and transport.

- The GE assessment demonstrates that a green economy transition offers Mauritius further opportunities for sustained economic growth, energy and water savings, increased agricultural productivity and green jobs. Green economy investments are expected to generate better economic outcomes than a business-as-usual (BAU) investment allocation, with GDP 6 percent higher in the GE case relative to BAU, by 2035. The cost of such public and private investment will be approximately 0.9 percent of GDP per year between 2014 and 2035. However, this is expected to generate annual savings of around 3 percent of GDP.

### **3.4 Green Economy Fiscal Policy Scoping Study Mauritius**

- The Mauritius Fiscal Policy Scoping Study UNEP 2014, made some recommendations to enhance current environmental fiscal measures and to exploit untapped opportunities for Environmental Fiscal Reform (EFR). The measures for the agricultural sector were to:
  - introduce a tax on chemical fertilizers, pesticides and/ or insecticides to encourage a shift to more benign organic products;
  - extend the current VAT refund on equipment for sugar cane planters to cover ecological inputs, such as organic fertilizers, pesticides and insecticides, in order to reduce the negative impact of chemical products on soil degradation and water pollution.

The measures are in line with the objective of transforming 50% of the agriculture sector towards more sustainable practices by 2030.

## 4.0. Agriculture Sector Analysis

### 4.1. Structure of the Agricultural Sector

- An Agricultural Census was carried out in 2014 (CA2014) which is 70 years after the last census dating back to 1940. Based on information collected in CA2014, the total number of agricultural holdings (excluding sugarcane and tea only) was estimated at 23,456 (Island of Mauritius: 18,350 and Island of Rodrigues 5,106) and were predominantly (99%) in the household sector. Household here means family business not structured as a formal company and a small fraction of backyard-type agriculture.
- In the Island of Mauritius, out of a total area of 64,683 hectares occupied by the holdings, 83% were used by businesses from the non-household sector, while the remaining 17% by household farms. This allocation was quite different in Rodrigues with more than 99% of the holdings' area occupied by household farms.

**Table 1: Number and area of holdings by sector, July 2013 - June 2014, Islands of Mauritius and Rodrigues**

Sector	Island of Mauritius					Island of Rodrigues				
	Number of holding	%	Area of holding (hectares)	%	Average area per holding (hectares)	Number of holding	%	Area of holding (hectares)	%	Average area per holding (hectares)
Total	18,350	100.0	64,683	100.0	3.5	5,106	100.0	1,767	100.0	0.3
Household	18,260	99.5	11,254	17.4	0.6	5,083	99.5	1,755	99.3	0.3
Non-Household	90	0.5	53,429	82.6	593.7	23	0.5	12	0.7	0.5

Source: Statistics Mauritius, Census of Agriculture 2014

**Table 2: Percentage distribution of holdings by size and sector, July 2013 - June 2014, Islands of Mauritius and Rodrigues**

Size of Total Area of Holding (perches)	Island of Mauritius				Island of Rodrigues			
	Household sector		Non-Household sector		Household sector		Non-Household sector	
	Number	%	Number	%	Number	%	Number	%
<b>All sizes</b>	<b>18,260</b>	<b>100.0</b>	<b>90</b>	<b>100.0</b>	<b>5,083</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>
Under 5	2,624	14.4	-	-	110	2.2	1	4.3
5 and less than 50	4,000	21.9	9	10.0	1,224	24.1	4	17.4
50 and less than 100	2,079	11.4	7	7.8	697	13.7	7	30.5
100 and less than 500	6,203	33.9	21	23.3	2,416	47.5	10	43.5
500 and over	3,354	18.4	53	58.9	636	12.5	1	4.3

Source: Statistics Mauritius, Census of Agriculture 2014

- The results show that in the non-sugar and non-tea farming, there is a skewed distribution with only 90 non-household farms out of the 18,350 total farms (or 0.5% of the total farms) occupying 83% of the land area. Moreover, about half of the household farms occupy an area of less than 1 acre.

**Table 3: Percentage distribution of holdings by Activity and Sector, July 2013 - June 2014, Islands of Mauritius and Rodrigues**

Holding's Activity	Island of Mauritius				Island of Rodrigues			
	Household sector		Non-Household sector		Household sector		Non-Household sector	
	Number	%	Number	%	Number	%	Number	%
<b>All activities</b>	<b>18,260</b>	<b>100.0</b>	<b>90</b>	<b>100.0</b>	<b>5,083</b>	<b>100.0</b>	<b>23</b>	<b>100.0</b>
Growing of crops	10,014	54.8	27	30.0	547	10.8	10	43.5
Raising of livestock & poultry	5,313	29.1	23	25.6	595	11.7	6	26.1
Growing of crops and raising of livestock & poultry (Mixed farming)	2,933	16.1	40	44.4	3,941	77.5	7	30.4

Source: Statistics Mauritius, Census of Agriculture 2014

- Table 3 shows that in Mauritius 55% of small farmers only grow crops and must therefore procure fertilizers. In Rodrigues, 7% practice mixed farming and benefit from recycling of nutrients between livestock and food crops activities. Table 3 shows that the majority of household farms on the Islands of Mauritius (87%) and Rodrigues (73%) were growing crops and/ or raising livestock and poultry mainly for sale. The lower figure for the Island of Rodrigues indicates higher importance of subsistence farming compared to the Island of Mauritius.
- In order to focus on the commercial small scale holdings, if the 14.4% holdings under 5 perches made up mostly of household backyard operations are eliminated, there are 15,636 commercial household type farms in the livestock and food crop sectors. Data provided by the Crop Extension Department of the Food and Agricultural Research Extension Institute (FAREI) show that there are 11,264 vegetable farmers occupying 6,964 ha of land. There is an estimated 3,065 ha under fruit crops. The table below provides an estimate of the breakdown of small farmers into vegetables, fruit crops, backyard (< 5 perches) and livestock from different data sources.

**Table 4: Breakdown of area and number of farmers per type of activity**

	Area Ha	Number of farmers	Source
Food crops	6,964	11,264	FAREI Crop extension
Fruit crops	3,064	3,064	Estimate based on 0.5 Ha per fruit orchard
Backyard	44	2,624	CEA 2014
Livestock	1,182	1,308	Balance
<b>Total</b>	<b>11,254</b>	<b>18260</b>	<b>CEA 2014</b>

Source: Statistics Mauritius, Census of Agriculture 2014

- Many small and medium sugar cane planters have abandoned their land under cane cultivation because of a non-profitable situation and of high operation costs. The past decade has witnessed a higher abandonment rate with 16,855 ha of land previously under sugar cane abandoned by their owners in comparison with a total land abandoned during the last 20 years of 19,890 ha. The bulk of the abandoned land is located in the southern region of Mauritius with 7,424 ha currently available (of which 6,331 ha was abandoned during the

last 10 years). This corresponds to 37% of the land abandoned during the last 20 years. The table below provides the area abandoned by region during last 10 years and last 20 years.

**Table 5: Abandoned land area under cane cultivation over the past 2 decades**

Region	Sugar Cane land abandoned over the last 10 years		Sugar Cane land abandoned over the last 20 years	
	Area (Ha)	%	Area	%
North	3,453	20	5,107	26
South	6,331	38	7,424	37
East	5,875	35	5,999	30
West	1,196	7	1,360	7
Country	16,855		19,890	

Source: Vikram Seebaluck; Report for the Preparation of a Cabinet Memorandum for the Production of Arundo Donax Bioenergy crop for Electricity Generation in Mauritius; 2015

- Table 5 shows the annual records of abandonment of sugar cane land from Sugar Industry Fund Board database. There is an average of 6280 Ha of abandoned land annually which is classified as still under cane cultivation but not being harvested. These fields have been left by their owners due to low yield, high costs of production and the decrease in sugar price amongst others.



**Table 6: Trend in Abandoned Sugar Cane Land - 2001 to 2015**

Year	Area Under Cane Cultivation (Ha)	Area Harvested (Ha)	Abandoned sugarcane land (Ha)
2001	77,321	72,087	5,234
2002	76,363	71,482	4,881
2003	75,563	69,995	5,568
2004	74,970	68,745	6,225
2005	73,267	67,404	5,863
2006	71,499	65,243	6,256
2007	69,831	63,188	6,643
2008	68,002	60,381	7,621
2009	65,859	59,108	6,751
2010	63,780	57,670	6,110
2011	62,000	55,777	6,223
2012	60,378	53,428	6,950
2013	59,370	52,312	7,058
2014	58,312	49,791	8,521
2015	57,424	51,694	5,830

Source : SIFB, Survey Report on Abandonment of Cane Land, 2010, subsequently updated

- According to the draft Renewable Energy Masterplan 2016, the small farmers whose average plot size varies between 0.10 ha to 4.22 ha have not been able to move into other production systems because of high investment costs and high risks of uncertainties.
- Although there is no in-depth analysis of the options, the draft Renewable Energy Masterplan mentions that *Arundo donax* cultivation is an attractive option of interest to the planters' community, in particular for ensuring the survival of the small ones. However, the draft Renewable Energy Masterplan has cautioned that an in-depth Environmental Impact Assessment is needed to fully evaluate the risks and mitigation options.
- Preliminary trials of *Arundo donax* would seem to indicate that subsidies may be required to make this option attractive to small planters because the main market for biomass would be the existing Independent Power Producers (IPPs) who have already signed long-term contracts on the basis of bagasse and coal. In the context of low oil prices and lower marginal cost for Solar PV, any future negotiations for dedicated biomass plants will be impacted by the relatively low benchmark of current marginal cost.
- The main channel used to market some selected agricultural products on the Island of Mauritius was as follows:
  - Vegetables through wholesalers (66%)
  - Fruits through wholesalers (48%)
  - Flowers through retailers (52%)
  - Cattle through retailers (57%)

- Goats through consumers (72%)
- Sheep through Consumers (69%)
- Pigs through Wholesalers (48%)
- Poultry meat through Wholesalers (70%)
- Eggs through Retailers (59%)
- Honey through Consumers (54%)

The figures show a high dependence on wholesalers for vegetables, fruits, pig and poultry.

- The CA2014 figures show that agriculture remains a key sector to ensure food security, rural employment and economic growth in Mauritius. In 2012, the contribution of agriculture to GDP was estimated at 3.4 per cent, while the share of agriculture in total employment in Mauritius stood at 8.3 per cent (SM, 2012a).
- Mauritius is no longer a predominantly agriculture-based economy and increasingly relies on imports. Domestic food crop production has risen by only 1.3 per cent between 2001 and 2011, compared to a population growth of 8.4 per cent over the same period. Though productivity has increased, agricultural land is being increasingly converted to residential and industrial use leading to a reduction in crop production and consequent need for increasing food imports. Food import costs have increased from Rs7.7 billion to Rs 31.4 billion between 2000 and 2011 (SM, 2012a). A large proportion of the food imports is made up of staples like rice, flour and pulses, which are not produced in Mauritius. The dependence on food imports makes Mauritius vulnerable to external food price dynamics. As a result, the country is aiming to improve food security.

#### **4.2. Review of Policies, Regulations, Standards and Instruments for Promoting Green Economy**

- The Strategic Plan 2016 – 2020 for the Food Crop, Livestock and Forestry Sectors (MAIFS, 2016) provides a good baseline on the structure, policies and strategies for the sector. The Strategic Plan 2016 – 2020 was carried out through a comprehensive consultative process and has taken on board the broader dimensions of sustainability of agriculture including sustainable forest management and biodiversity conservation.
- The high-level policy in the Strategic Plan 2016 – 2020 is clear in its objective of achieving 50% of agriculture switched to a more sustainable agriculture. The definition of organic/bio/sustainable agriculture has been the subject of debates both in the public and private sector institutions. There is consensus that a phased approach is needed to switch to organic agriculture and a 3-level system has been proposed. The Mauritius Chamber of Agriculture (MCA) is promoting 'l'Agriculture Raisonnée', while the Government has set up the MauriGAP Certification Scheme which is the Level 1 in the process to move to Good Agricultural Practices(GAP).
- Sustainable agricultural production is not yet mainstreamed. UNDP has provided funding to FORENA, an environmental NGO, to support bio-farming on a small scale up to Ecocert certification. Velo Vert is another initiative by an entrepreneur with a network of small growers who are however not certified.

- There is no standard, law or regulations for the processing of livestock waste. Chicken waste mixed with spent wood chip bedding is currently being sold to planters who have to wait for it to decompose and stabilize for use in their crops. Pig waste, although mostly centralized at St Martin, is not treated.
- The new Government Programme for the Republic of Mauritius (2015-2019) commits to promoting natural farming and organic production (GoM, 2015), as well as increasing food self-sufficiency. According to the modelling analysis for the Green Economy Assessment report, an increase of 10 per cent of the area under sustainable food crop production would result in an increase in crop yields of 11.2 per cent per year by 2025, compared to Business as Usual. The overall objective is to increase the land area under sustainable cultivation by 10 per cent by 2025.

### **4.3 Assessment of the business environment – Investment Climate and Tax Incentive**

- The MAIFS and Small Farmers Welfare Fund provide incentives to small food crop farmers and some facilities to small livestock farmers like grants for building animal sheds.

In order to give a boost to organic agriculture, Government plans to introduce the Bio-farming scheme to be delivered by the Ministry of Agro-Industry and Food Security to both small and large farmers. This will provide access to an 8-year tax holiday, special grants for training, and concessional loans. Planters benefit from VAT refund on equipment.

- Government provides subsidies for compost from recycled municipal solid waste. In practice, the quota of subsidized compost per acre is converted into the equivalent amount of free compost.
- The Agricultural Production and Marketing Information System (APMIS) of FAREI, operational in 2010, provides statistics, production data and prices on food crops at retail and wholesale level. The system is maintained and updated but not in real time due to lack of resources. There are also no facilities to connect buyers to sellers. The main purpose of the system is to diffuse price information to buyers and sellers and provide production status to growers.

### **4.4 Challenges and Opportunities: Agricultural sector**

- The growing local demand for food, particularly processed and ready to eat food, has been mostly catered for by imports which reached over MUR 31.36 Billion in 2014.

The 33% fish and fish preparations include the imports of tuna for processing. Meat, meat preparations, dairy products and birds' eggs make up 19.7% of imports, which is 13% higher than in 2013. The cereal staple foods (rice, wheat, flour rice, wheat flour and cereal preparations) make up 15.21% of imports, which is 5.4% lower than in 2013. The fruits and vegetables imports at 9.67% in 2014, is 8.2% higher than in 2013. The other food imports which include all the processed and ready to eat foods made up 22.41% ,which is 12.43% higher than in 2013.

**Table 7: CIF value of food imports in 2013 and 2014 from Digest of External Trade statistics**

	<b>2013</b>	<i>% of Total</i>	<b>2014</b>	<i>% of Total</i>
<b>Food and live animals</b>	<b>31,573</b>	<i>100.00%</i>	<b>31,361</b>	<i>100.00%</i>
Meat and meat preparations	2,136	6.77%	2,276	7.26%
Dairy products and bird's eggs	3,362	10.65%	3,902	12.44%
Fish and fish preparations	11,880	37.63%	10,353	33.01%
Wheat	1,979	6.27%	1,483	4.73%
Rice	1,780	5.64%	1,888	6.02%
Wheaten flour	57	0.18%	37	0.12%
Cereal preparations	1,265	4.01%	1,362	4.34%
Vegetables and fruits	2,821	8.93%	3,032	9.67%
Other	6,293	19.93%	7,028	22.41%

Source: Statistics Mauritius, 2014

- While the food import figures must also be correlated to higher tourist arrivals, the growing trend in imports of livestock based products for a total cost, insurance and freight (CIF) value of 6.1 Billion MUR and imports of fruits and vegetables for a total CIF value of 3.03 Billion MUR in 2014 shows the potential of import substitution in these 2 sectors by local, sustainable and quality certified products.
- From the digest of agriculture 2013, the gross output of the agricultural sector was 16.26 Billion MUR compared to a value added of 10.55 Billion MUR corresponding to a ratio of 1.54. Using this ratio, the gross output of the local food crop sector can be estimated to 3.55 Billion MUR and that of the Livestock and poultry sector at 3.66 Billion MUR, made up mostly of the local poultry sector where Mauritius is self-sufficient. The local poultry sector is a success story which was possible through vertical integration in animal feed production by the large operators.
- Loss of soil fertility though prolonged and intensive use of agro chemicals is a threat to biodiversity and the short and long term productivity, as beneficial micro-organism are being destroyed. The restoration of soil fertility and carbon sequestration with organic compost and manure is a green business opportunity in its own right while being a sine qua none condition for successful mainstreaming of the conversion to sustainable agricultural practices.

- Another green business opportunity is fruit production on abandoned cane lands. The carbon sequestration, green landscaping and green jobs for orchard labour are justifications for such projects.
- Although there is a standard for compost in Mauritius, the legal and regulatory framework for compliance tests to be carried out by independent accredited bodies do not exist. The permissible threshold limits of heavy metals and pollutants in compost from municipal solid waste which could leach into aquifers and the risk of persistence should be investigated.
- As per the Country Programming Framework (FAO 2014), Mauritius has geographical advantage to control animal diseases (i.e. isolated island), and is officially recognized as a Foot and Mouth Disease (FMD) free country. However, Mauritius imports live goats from Kenya, and imports various meats from China, Egypt, India, Kenya and Zimbabwe ( FAO, 2014). With its size of pig production, it is crucial to have good veterinary surveillance system in place with functioning port/airport quarantine system, equipped with an efficient diagnostic laboratory to mitigate the threat of FMD and other trans-boundary diseases to be introduced into the country.
- The livestock sector, both small scale and larger scale, is not competitive with unregulated and cheap imports of live animals, meat and milk products. Incentives scheme for small dairy farmers have not been able to boost the sector. In order to turn around the sector, there is an opportunity for a new livestock model which integrates sustainable livestock waste processing and optimal value addition to waste as nutrient inputs for food crops. The legal framework does not currently allow dairy products to be processed on farm sites. This can be addressed in the new model.
- Supermarkets and hotels order small quantities of a wide range of fruits, vegetables and herbs on a regular basis. The logistics requirements for cold chain, food hygiene standards and traceability cannot be met by small planters and currently are only met by large growers and distributors. Consequently, large growers and distributors have access to supermarket and hotel distribution channels and therefore have an advantage over small planters who depend mostly on intermediaries for marketing.
- The skewed size distribution of farms (Table 4) shows that non-household farms which occupy 83% of the land area can be mechanized and therefore can achieve lower production costs compared to small household farms who are disadvantaged in terms of both size and distribution logistics.
- A number of issues have been highlighted about the 3 existing wholesale markets in Port Louis, Vacoas and Flacq, including:
  - The requirement for small planters to physically transport their products to the 3 markets with a limited choice of buyers at each market tends to tip the balance of power in favor of intermediary buyers.
  - There are poor standards of hygiene and storage in the existing wholesale markets.
  - Although Wooton is at the center of the island, it implies a trip of 30 Km for many of the planters and their products and another trip to the final destination.
- Government is planning to improve the wholesale trade through a unique centralized wholesale market at Wooton. This approach has the advantage of offering more options to

sellers which could improve their supply chain power. There will also be the possibility for farmers to sell directly to domestic consumers and retailers which is inspired from the concept of farmers markets which is a step towards fair trade. Even for a small island like Mauritius, a single farmers' market is not practical to service a fresh produce commodity market for end consumers.

- The wholesale market concept does not address the fundamental upstream supply chain weakness of dispersed small scale production. Moreover, there will still be the issue of traceability in a wholesale market to keep records of the history of chemical treatments which can be more easily tracked in the case of a large farm supplying to a large client.
- There is an opportunity for clustering small planters upstream in the supply chain around a concept of pack house to address logistics, branding and traceability issues. Past attempts of such clustering have failed because the management was entrusted to one of the planters. The lesson learnt is that management of the pack house must be done by a specialist focusing on the logistics and distribution functions.
- Over and above the indisputable advantage of a pack house close to the farm for post-harvest processing and optimal storage conditions, the pooling of capacity of small farmers offers the following advantages:
  - It can improve the balance of power between a large number of small farmers and a small number of intermediaries
  - It can improve the logistics costs for transporting fresh produce in optimal conditions from the production to the consumption centers.
  - The decentralized pack houses can also serve as proximity regional farmers market for surrounding consumers, restaurants and hotels.
  - Local pack houses make it safe and convenient for women small scale growers to deliver their produce during the day as compared to the wholesale market where delivery starts at very early morning hours.
  - The packing houses can also cater for ship supplies and export markets.
  - Through localization of production and consumption, decentralized pack houses can make an important contribution to sustainable production and consumption.
  - Regional pack houses can integrate into the concept of a central wholesale market with the advantage of direct logistics of produce from pack houses to final markets, and improved critical mass for small farmers.
- The main challenge however, is to develop a business model based on centralized logistics and storage at the pack house in which participating farmers have an equity stake and contractual relationship between the pack house and farmers, are more collaborative and long term instead of adversarial.
- The market pull dimension is critical in any supply chain transformation initiative. There have been timid attempts at creating awareness for more sustainable and healthy foods by SMEs such as Earth Market / Slow Food Tifa Tifa. Unless consumer education and the resultant spontaneous demand is mainstreamed, these attempts will remain marginal. An opportunity to be tapped here is to connect sustainable quality agro produce with the emerging niche consumers for sustainable health foods. SWITCH Africa is presently funding a green retail project where the leverage power (PULL) of supermarkets will be tested for sustainable production from growers.

- Control of pesticide residues fall under the Food Act but is under the responsibility of the Ministry of Health and Quality of Life. Fresh fruits, vegetables and pulses are not controlled. Moreover, the Ministry of Health and Quality of Life cannot enforce the law which does not provide for penalties in case of non-compliance.
- Food samples are tested in the food laboratory of the Ministry of Agro Industry and Food Security. There are insufficient resources to test the presence of all molecules. The delay of a few months to obtain the results does not enable useful action on the incriminated lot of products if found non-compliant.
- There is currently no system or regulatory framework in place for traceability of products which limits the possibility of setting up a sustainable agriculture supply chain.
- The competing demands on limited land resources, decreasing soil fertility, water scarcity, and insufficient interest of the young generation in agricultural activities poses challenges to the food crop sector (MoESD, 2013).
- Sugar production has been slowing due to the end of the ACP-EU (Africa, Caribbean, and Pacific – European Union) sugar protocol. The reforms of the ACP-EU protocol led to a 36 percent decrease of the price of sugar exported to the EU (WTO, 2008). This sector is also undergoing profound structural changes, moving from solely raw sugar production to a diversified sector producing refined and special sugars, as well as through using bagasse to supply energy to the grid. Between 1993 and 2013, the area under sugar cane cultivation decreased from 74,000 ha to 54,000 ha, a drop of 27 percent (SM, 2012a).
- The sugar estates have been diversifying into fruits, protected agriculture, hydroponics farms and food crop production in large, mechanized and well managed operations. Due to the limited market size in Mauritius and the costly logistics of export of fresh produce the output of large farms could crowd out the small household type farms.
- Intensive use of agro-chemicals for increased agricultural productivity has been common practice. Statistics show that the amount of fertilizer imported over the years has been more or less constant but the amount of pesticides brought in has increased (MoESD, 2011). Shifting to agro-ecological practices through the expanding use of compost, improving water consumption efficiency, and implementing integrated pest management programmes could increase long-term agricultural productivity.
- The island's agriculture is inextricably linked to the health of ecosystems through soil formation, water regulation and carbon sequestration and a new model must be identified to achieve triple bottom line for small farmers.

#### 4.5 Capacity Building needs: Agricultural sector

- The Country Programming Framework (CFP) 2014 – 2017 prepared by FAO identified 2 priority areas for capacity building in the areas of agribusiness development and sustainable agriculture:
  - **Priority Area A: Support to agribusiness development** with focus given to strengthening the enabling environment – strategies, legal and management frameworks and institutional capacities in support of agribusiness development for selected strategic value chains.
  - **Priority Area B: Promote sustainable agriculture for food security** with a focus given to strengthening the enabling institutional environment related to land use management, early warning system for animal and plant diseases and pests, and agricultural statistics for improved evidence-based decision making.
- The International Labour Organisation (ILO) Green Jobs for Mauritius study concluded that the output and employment multiplier for the green sub-sector is higher than for conventional agriculture (1.3 vs. 1.2 for output and 2.6 vs. 2.7 for employment). Accordingly, employment gains range from +5 percent (9 and +7 percent output). This is because green agriculture relies relatively more on inputs which are produced locally such as organic fertilizers and pesticides. This implies the use of more transportation, packaging and other processes in the production of these inputs.
- The main capacity requirement to achieve a mainstreaming of sustainable agriculture is to inculcate to the small household type farmers the fundamentals of restoration of soil fertility, optimal utilisation of organic compost and manure, and rational use of bio-pesticides. The FAO capacity building will be crucial in terms of institutional capacity building. In view of the target set at 50 percent and the number of commercial household farms (over 15000), FAREI operates both at an individual and group level. However, additional resources are required for more effective and timely intervention.

#### 4.6 Conclusion and Way forward: Sustainable Agricultural sector

- Before the advent of motorized transportation, industrialization and global trade, agriculture in Mauritius was carried out using sustainable practices based on a symbiosis between the livestock sector and food crops, with some imports of guano fertilizer.
- Decades of heavy reliance on chemical fertilizers and agrochemicals have increased the volume of production, but affected the quality of agro produce and has contributed to the degradation of soil fertility. The fundamental principle of sustainable agriculture is that soil is a living entity which must be preserved and enhanced with nutrients of organic origin.
- The status of sustainable agriculture in Mauritius today is that sustainable agriculture faces fundamental and multiple challenges in terms of degraded soil fertility, lack of organic fertilizer inputs, poor knowledge of sustainable agricultural practices at the level of household farms and poor linkage between household farms to demand and markets.



- In the context of globalisation and liberalisation of trade, the role of the local livestock sector must be reviewed beyond import substitution of meat and milk products to that of its contribution to recycle organic nutrients as inputs for sustainable food crop production.
- The policy response to the challenges and opportunities must therefore integrate the costs and benefits across the production and consumption dimensions to capture the issues at stake.

#### **4.7 Recommendations and Country projects**

##### **Legal and regulatory framework**

- The National Dangerous Chemical Control Board (NDCCB) controls the imports of pesticides and other agrochemicals. The Fertilizer Act caters only for chemical fertilizers. A legal and regulatory framework must be introduced for regulating the quality of pesticides, including its sale mechanism and monitoring/enforcement. There is a need to review the framework to include the control and quality of locally produced and imported bio-inputs including soil conditioners, bio-fertilizers, plant based extracts and fungal organism used in sustainable agriculture.
- A legal and regulatory framework must be introduced for regulating the quality of compost and vinasse by-products used in sugar cane. The provision of subsidies by Government could be tied to the compliance to standards as validated by an independent accredited laboratory.
- The rearing of poultry above 5000 heads and rearing of cattle, pig, sheep or goat only require a Preliminary Environmental Report (PER). There is a need to review the policy and current practices of processing of livestock waste in terms of the contribution to Greenhouse Gases (GHGs), leaching of nitrates into ground water, and the nuisance factor of smell for the neighborhood. The main objective would be to optimize the recycling of nutrients for sustainable food crop production.
- A legal and regulatory framework must be introduced to regulate the production and sales of sustainable agro produce, including the introduction of an affordable and adapted certification system. Government must support the implementation of the MauriGAP Certification Scheme for small household farms to achieve a critical mass.
- The Food Act must be reviewed to include fruits, vegetables and pulses and the control and enforcement mechanisms must be reinforced to achieve compliance.

##### **Country Project**

##### **Create Agro ecological zones**

- Based on the challenges and opportunities highlighted in section 3.4, the institutional capacity building needs identified and planned, and the review of the legal and regulatory

framework recommended will constitute the necessary, but not sufficient conditions, for transforming 50 percent of the sector to sustainable agriculture particularly at the level of small farms.

- Additional measures recommended in the form of country projects to address specific supply chain issues are described below:
  - Government to create 10 Agro ecological zones including some in the following locations: (Wooton, St Hubert, Belle mare, Palmar, St Martin, La Chaumière, La Marie, Henrietta). The main function of these zones will be to create a critical mass and a symbiotic relationship among farmers so that they can benefit from the new sustainable agriculture framework being set up.

The country project will have to include incentives to achieve the following objectives:

- Grouping of livestock operations in one location for sustainable processing of animal waste and recycling of nutrients with the capture and value addition to biogas for economically viable operations and as the main cohesive force to sustain the long term collaborative relationship between livestock farmers.
  - A professionally managed packing house to add value to the agro produce from the zone while also addressing issues of traceability, collective bio-certification, branding and to meet the requirements of distribution logistics. With this established supply side capacity, localized demand from consumers, restaurants, hotels can be mobilized to pull the value chain.
- The different agro ecological zones could specialize in production, processing and branding of specific products well adapted to the agro climatic conditions (Produits du terroir). This form of differentiation cannot be achieved at the level of individual household type farms.
  - The quality of produce, professional management and ‘produit du terroir’ features could constitute the base for Agro Tourism development which constitutes a linkage with the tourism sector.
  - The development strategy proposed for small holder farmers could be an opportunity for entrepreneurs from 2 sectors with existing expertise to grow:
    - Project developers and contractors in the Engineering and Renewable Energy which is an emerging sector with a high potential for export growth in the African market.
    - The emerging exporters of fruits and vegetables who could constitute the core of pack house operators.
  - Both of the above initiatives will require a collaborative and incentive framework to ensure the following:
    - A long-term feed-in-tariff by the Central Electricity Board (CEB) subsidized by Government for small scale farm-based biogas to be bankable.
    - A financing framework with built-in provisions for small livestock and food crop farmers to own shares in pack houses to ensure an equitable sharing of reward while also providing for professional centralized management.
    - Contract farming arrangements to secure market.
  - This approach will allow small operators in 4 sectors (food crops, livestock, energy services, exporters) to collaborate in an integrated supply chain to create value and share it equitably.

As such, the net economic benefits of the country project will spill outside the agriculture sector. The country projects aim at securing the economic viability of the small holder livestock and food crop farmers through an inclusive and green growth strategy. In the do-nothing scenario, experts in support institutions have predicted the small holder farmers will not survive market forces.

- The validation of an integrated, economically viable and environmentally sustainable business model for small farmers would enable them to capture a share of the emerging organic produce market and thus ensure the long term livelihood of a large fraction of the 15,000 commercial small holder farmers in the food crop and livestock sectors.
- The model once validated could be of interest to small sugar cane farmers who could opt to switch to a viable food crop and livestock farming operation or to rent their land to agro entrepreneurs engaged in active farming. Out of the 20,000 ha of land abandoned over 20 years, a large part has been re-allocated. It is estimated that at least 5,000 ha are still lying idle.
- Over and above the fundamental requirement to reach a long term sustainable model, there is a need to raise the profile of the small food crop and livestock farmer to attract young and new entrants in the sector to tap the dormant potential of abandoned cane land.
- With rising affluence, the local food market is evolving towards more sophisticated, transformed and ready to eat foods. The emerging culture of eating out in food-courts and the growing tourist arrival will fuel demand for quality fresh produce and transformed foods.
- In the context of an upgraded and streamlined legal and regulatory framework to create a level playing field between imported food products and locally produced and transformed foods, there is significant opportunity to develop linkages between the agriculture and the food transformation Small and Medium Enterprises (SME) manufacturing sectors.

## 5.0. Manufacturing Sector Analysis

### 5.1 Structure of the manufacturing sector

- Over the years, manufacturing has played an important role in the structural transformation of the economy. Manufacturing accounts for 14.8 percent of GDP (2015) - the highest of any sector.
- Aggregate employment in the sector is estimated at 111,700 persons, or 19.7 percent of the total labour market. Textiles and apparel contributed to nearly 31 percent of the manufacturing GDP, while the food and beverage (excluding sugar) sector accounts for 35 percent (2015). Fish and fish preparation are an increasingly important part of this sector, accounting for 20 percent of our exports.
- In recent years, manufacturing value-added has increased, but overall growth is slowing. A few high technological enterprises have been engaged in the production of sophisticated medical devices and high precision plastic products. The growth rate of the manufacturing sector averaged 1.9 percent from 2008 to 2015 compared to 6 percent during the nineties.
- The most recent source of data on SMEs is the 2013 Census of Economic Activities (CEA).

**Table 8: Data on small establishments: production units, persons engaged, and value added**

	2007	2013	Percentage change
Production units	92,400	125,500	35.8
Persons engaged	211,600	283,000	33.7
Value added (Rs million)	43,040	82,060	90.7

Source: Statistics Mauritius, CEA 2007 and 2013

From 2007 to 2013, there has been an increase of 35.8 % in the number of units and an increase of 90.7 % in the value addition. Out of the total of 125,000 units, only 12 % or 15,060 were engaged in manufacturing. The average employment of 2.25 persons per unit restricts the potential for growth and more value addition of SMEs.

- The Micro, Small and Medium Enterprises (MSME) manufacturing sector has a relatively low value added of 11.1 % compared to service sectors like wholesale and retail trade (31.6 %) and transportation and storage 12.4 %. This shows that manufacturing at the level of MSMEs does not have the attractiveness compared to service activities. The MSME construction sector represents 10.3 % of the total and has a value added of 12.7 %.

**Table 9: Units, employment and output of small production units by industry group**

Industry group	Production units		Persons engaged		Gross output		Value added	
	Number	%	Number	%	Amount (Rs mn)	%	Amount (Rs mn)	%
<b>Total</b>	<b>125,543</b>	<b>100.0</b>	<b>282,971</b>	<b>100.0</b>	<b>131,391</b>	<b>100.0</b>	<b>82,061</b>	<b>100.0</b>
<b>Manufacturing</b>	<b>15,241</b>	12.1	<b>36,207</b>	12.8	<b>17,499</b>	13.3	<b>9,083</b>	11.1
<b>Construction</b>	<b>12,911</b>	10.3	<b>36,326</b>	12.8	<b>25,650</b>	19.5	<b>10,390</b>	12.7
<b>Wholesale and retail trade; repair of motor vehicles, motorcycles</b>	<b>46,776</b>	37.3	<b>98,804</b>	34.9	<b>34,470</b>	26.2	<b>25,970</b>	31.6
<b>Transportation and storage</b>	<b>21,520</b>	17.1	<b>37,838</b>	13.4	<b>16,170</b>	12.3	<b>10,213</b>	12.4
<b>Accommodation and food service activities</b>	<b>10,699</b>	8.5	<b>27,367</b>	9.7	<b>11,680</b>	8.9	<b>6,905</b>	8.4
<b>Information and communication</b>	<b>557</b>	0.4	<b>1,788</b>	0.6	<b>1,072</b>	0.8	<b>589</b>	0.7
<b>Financial and insurance activities</b>	<b>175</b>	0.1	<b>680</b>	0.2	<b>549</b>	0.4	<b>471</b>	0.6
<b>Real estate activities</b>	<b>600</b>	0.5	<b>1,200</b>	0.4	<b>440</b>	0.3	<b>365</b>	0.4
<b>Professional, technical and support service activities</b>	<b>3,978</b>	3.2	<b>12,656</b>	4.5	<b>9,301</b>	7.1	<b>7,316</b>	8.9
<b>Education</b>	<b>1,853</b>	1.5	<b>5,451</b>	1.9	<b>1,410</b>	1.1	<b>1,088</b>	1.3
<b>Human health and social work activities</b>	<b>1,705</b>	1.4	<b>3,687</b>	1.3	<b>1,783</b>	1.4	<b>1,334</b>	1.6
<b>Arts, entertainment and recreation</b>	<b>3,408</b>	2.7	<b>10,083</b>	3.6	<b>8,090</b>	6.2	<b>6,246</b>	7.6
<b>Other services</b>	<b>6,119</b>	4.9	<b>10,884</b>	3.8	<b>3,277</b>	2.5	<b>2,092</b>	2.5

Source: Statistics Mauritius Census of Economic Activities (CEA), 2013

- The data from Small and Medium Enterprises Development Authority (SMEDA) shows that out of the 25,257 enterprises registered, only 12,541 (49.6 %) are operational. Manufacturing MSMEs represent 41.6 % of the total with 5,227 units followed by wholesale, retail trade and garages with 3,389 operational units which shows that SMEDA is more focused on manufacturing than service activities.

- The main reasons for the non-operational units are entrepreneurs who could not secure premises and/or permits and clearances for their operation. The complexity and cost of compliance to regulations also led to some SMEs operating informally.

**Table 10 : Number of SMEs registered with SMEDA by industry group and year, August 2005 – 2015**

Industry group	Aug 2005 to 2011	2012	2013	2014	2015	Total
Agriculture, forestry and fishing	836	97	93	117	171	1,314
Mining and quarrying	4	1				5
Manufacturing	7,105	617	553	459	662	9,396
Water supply; sewerage, waste management and remediation activities	15	4	1		2	22
Construction	603	138	153	146	234	1,274
Wholesale and retail trade; repair of motor vehicles and motorcycles	4,452	699	622	518	700	6,991
Transportation and storage	61	15	22	19	23	140
Accommodation and food service activities	1,771	215	203	193	210	2,592
Information and communication	78	25	19	20	44	186
Financial and insurance activities	1	4		2	1	8
Real estate activities	13	1	5	5	8	32
Professional, scientific and technical activities	244	67	66	68	102	547
Administrative and support service activities	379	77	92	93	174	815
Education	68	17	16	19	17	137
Human health and social work activities	68	16	13	8	17	122
Arts, entertainment and recreation	86	15	20	21	30	172
Other service activities	1,044	127	118	101	104	1,494
Other (Activities not properly defined)	8			1	1	10
<b>Total</b>	<b>16,836</b>	<b>2,135</b>	<b>1,996</b>	<b>1,790</b>	<b>2,500</b>	<b>25,257</b>

Source: SMEDA, 2016

## 5.2. Review of policies, regulations, standards and instruments for promoting Green Economy

- Manufacturing is one of the main energy-consuming sectors, accounting for 24 percent of energy consumed in 2013. Although energy productivity has increased by 5.7 percent between 2011 and 2012, additional improvements could be made to reduce energy waste in industrial processes. A recent Joint Economic Council (re-named and henceforth addressed as Business Mauritius) and Association for Industrial Development study on “Mapping of Energy Efficiency in Industry and Tertiary Sectors in Mauritius” in 2012 states that: “ there is a potential through short-term actions at no to low-cost of more than Rs400 million/year in energy savings in large industries and buildings. The total saving, including higher cost activities, is Rs1.1 billion per year.”
- The manufacturing sector has traditionally benefitted from low electricity tariffs, cross subsidized by the commercial and large residential consumers as a measure to support their competitiveness. There have been recommendations to introduce cost reflective tariffs for CEB to cover its costs. However, due to the low oil prices since the end of 2014, the marginal cost of production of CEB is currently lower than the lowest industrial tariffs which has relieved the financial pressure on CEB.
- In spite of the subsidized tariffs, Business Mauritius with funding from the European Union (EU) and Agence Francaise de Developpement (AFD) has initiated the Programme National d’Efficacité Energétique (PNEE) which aims at creating a market for energy efficiency in CIF and cooling) with 52 enterprises being audited and about 20 more targeted. The Master Plan on Energy Efficiency 2015- 2030 has recommended the setting up of a PNEE for SMEs. The Energy Efficiency Masterplan has not been approved by Government yet.
- Mauritian enterprises have a strong understanding and awareness of sustainability. According to a survey conducted by the ILO in 2012, Mauritian enterprises are conscious of the need to improve the sustainability of their production processes. In particular, business managers are aware of the economic, social and environmental importance of sustainable practices such as energy saving, more efficient use of materials, reduction of waste water and adoption of pollution control and cleaner production methods (ILO, 2013).
- In terms of green economy, energy and water efficiency improvements are a central priority for the manufacturing sector. According to the GEA modelling analysis, the improvement of energy efficiency in manufacturing is projected to generate savings on electricity consumption between 2015 and 2020 of about Rs1.3 billion, reaching Rs6.5 billion by 2030.
- Added economic benefits are also projected to result from investments in industrial water efficiency. In particular, water savings would amount to about Rs101 million and Rs322 million by 2020 and 2030, respectively, corresponding to an annual average of about Rs20 million by 2030.
- A sophisticated policy framework for the environment is in place to control pollution from manufacturing. The National Environment Policy of 2007 adopted the polluter pays principle. The Environment Protection Act (EPA), amended in 2008, then established a comprehensive enforcement of procedures as well as regulations and standards for environmental protection. As of April 1st 2009, the Environment Protection (Industrial Waste Audit) Regulations entered into force to prompt industries to optimize resource use,

develop waste management systems and comply with the prescribed discharge and emission regulations.

- Only a small number of firms have implemented formal environment management systems, such as ISO 14000. About 10 enterprises in Mauritius are certified ISO 14001 (Industrial Observatory, 2015). More advanced sustainable production concepts, such as Life Cycle Assessments and Eco-design, are not yet applied.
- The Ministry of Energy and Public Utilities, through the Energy Efficiency Management Office (EEMO), has implemented capacity building of Energy Auditors. Under UNDP / GEF funding, 60 Energy Auditors have been trained by Econoler. 42 have passed the examination and have been certified by the certifying body. When the relevant regulations are enforced, these certified auditors will carry out mandatory audits in industry and other large consumers as may be decided by EEMO. Under the Energy Efficiency Act 2011, the Energy Efficiency Management System will apply to consumers benefitting from concessionary tariffs. The policy, legal and regulatory framework is already in place. The Energy Efficiency (Registration of Energy Auditors) Regulations 2016 has already been gazetted on 5 March 2016.
- After the first CEB scheme (SSDG), CEB launched the Net Energy Metering (NEM) scheme in 2015 for a capacity of 1 MW for industrial and commercial consumers, but was mostly subscribed by commercial consumers. This shows that in the absence of differentiated support to the industrial operators, particularly at SME level, it is commercial consumers who will benefit from renewable energy schemes because of a lower payback period resulting from higher consumption tariffs.
- This policy also leads to a long lasting financial erosion of CEB, and hence Government finances, as the highest paying consumers cross subsidizing the lowest paying industrial consumers are being allowed to net meter and to fix their energy costs under a 20 years contract while the industrial consumers will remain in the subsidy bracket of the Government and will be fully exposed to future oil prices when cross subsidization may no longer be financially sustainable.

### **5.3 Assessment of the business environment – Investment Climate and Tax Incentive**

- The new Government Programme for the Republic of Mauritius (2015-2019) has targeted SMEs as the main engine for growth. The Ministry of Business, Enterprise and Cooperatives has initiated a consultancy to develop a 10-Year Masterplan for the SME sector. The setting up of 'Mybiz' as a one-stop-shop has given a boost to the process of creation of new SMEs. However, after the initial creation of the company, only a few proceed to become full fledged SMEs with employment.
- Existing training schemes for the unemployed include:
  - DTP : Dual Training Programme
  - BTW : Back to work Programme
  - YEP : Youth Employment Programme
  - GTES : Graduated Training for Employment Scheme



- For the purposes of policy recommendations for switching to green and in line with Government policy of mainstreaming the contribution of SMEs in the economy, 5 key areas of intervention have been identified:
  - The educational system is the pipeline of future entrepreneurs. There is a need for research into the root causes as to why the educational system is producing more job seekers than entrepreneurs and to propose remedial actions.
  - The second area of intervention is the informal and micro enterprises made up mostly of necessity entrepreneurs who have not secured a job in the private sector.
  - The established small enterprises producing mostly for the local market face the challenges of global competition since local consumption has shifted to a distribution system consisting mainly of foreign franchises with their own brands.
  - The medium sized enterprises produce both for the local market and for export. Many of them need assistance in their transition from a family managed business to a more formal corporate structure.
  - The large corporate sector mostly originates from the sugar industry and has maintained the traditional mindset of keeping control on the full value chain. This limits the possibility of outsourcing to a network of SMEs, which is a dominant model in other countries.
  
- Taking into consideration the declared Government policy of inclusive and green growth and the current situation of SMEs, the Switch Africa Green project objectives of development of green businesses, eco-entrepreneurship and implementation of SCP practices could be one of the pillars of the SME 10-Year Masterplan which will lead to implementation of policies, and incentive frameworks to realize Government objectives.
  
- Globally, buyers of manufactured goods are increasingly incorporating environmental considerations in their terms of engagement with manufacturers. These agreements include standards for water treatment, waste disposal and recovery, transporting hazardous material and promoting energy efficiency to ensure lower carbon dioxide emissions.
  
- In Mauritius, there is an opportunity for Government procurement policies and an incentive framework for procurement and outsourcing by large corporates to be geared towards SMEs to stimulate inclusive and green growth.
  
- The SME development certificate introduced in 2016 ,which provides for an 8-year tax holiday and concessionary loans, is currently applicable to SMEs engaged mainly in production of renewable energy, ICT services and bio farming activities. In budget 2016-17, the SME development certificate was extended to sole traders and cooperatives. However, the range of sectors eligible have remained unchanged.
  
- The Industrial Waste Assessment project by the Ministry of Industry, Commerce & Consumer Protection, with the collaboration of Business Mauritius and the assistance of UNIDO in 2016, has shown that the policy framework does not enable the private sector to carry out integrated management of industrial waste.

## 5.4 Challenges and opportunities: Manufacturing sector

- The Industrial and SME Strategic Plan 2010- 2013 by the then Ministry of Industry, Science & Research and the Ministry of Business, Enterprise & Cooperatives identified uncoordinated institutional support, inadequate economic infrastructure, weak technology/innovation base, low productivity, product and market concentration and an inward-oriented manufacturing sector, as major weaknesses.
- The key recommendations of the 2010 – 2013 strategy discussed at a consultative workshop was for Mauritius to build up a strong knowledge, science, technology and innovation capacity which would enable it to reorient towards high value added products and services and to position itself as a hub for knowledge, logistics/distribution, finance/business and service-oriented activities. In defining its strategies, Mauritius has to inspire itself from the experience of successful East Asian economies that have adopted a structuralist approach underscored by strong Government intervention to steer their economies on a high growth path.
- In the context of the National Export Strategy (NES) 2016, Enterprise Mauritius, with technical assistance from ITC, assessed the Trade Support Network (TSN) based on the level of coordination between Trade Support Institutions (TSI) and individual TSI capacities through consultations, interviews, desk research and a survey. Although the NES document has not yet been finalized, preliminary findings show evidence that some critical linkages are either weak or altogether missing: like the weak links between the academic infrastructure including Tertiary Education and Technical and Vocational Education and Training (TVET) institutions. Survey results indicated that neither groups reported connections with the main TSIs that provide direct trade services related support to the private sector.
- The NES identified a number of TSI islands – comprised of 2-3 TSIs – that exist without any direct connection with the TSN ‘mainland’ made up of Enterprise Mauritius, Mauritius Chamber of Commerce and Industry (MCCI) and Board of Investment (BOI). This indicates that information is not being shared between these islands, and other TSIs that are relatively more linked. One such instance is the Mauritius Research Council (MRC), an apex body to coordinate and promote investment in research. As per NES, MRC is not connected to other TSIs involved in research such as universities etc. The MRC and Business Mauritius co-chair the CRIGS - Collaborative Research Innovation Grant Scheme, which aims at reinforcing collaboration between universities and research centres with the private sector. The first pre-defined priority area of research dates back to July 2015 on alternatives to plastic bags.
- Research & Development (R&D), Innovation and Technology Transfer are some of the main drivers for creation and growth of high potential SMEs. Over the past two decades, there have been practically no cases of SMEs being created as a spin off from R&D activities, Innovation and Technology Transfer driven by academia or Mauritius Research Council confirming the findings of NES 2016.
- NES 2016 has highlighted weak inter-ministerial and inter-agency coordination leading to weak service delivery to SMEs. Scope exists to strengthen the coordination and information flow between Ministries and their parastatals.

- There is a perception that a conservative banking system has been a constraint for start-ups and growing SMEs to graduate to successful enterprises. This is one of the reasons behind the Government's decision to offer concessionary loans to newly created SMEs through Maubank.
- With the transformation of the distribution supply chains in favour of hypermarket and proximity supermarket chains, the manufacturing sector and particularly the Small, Medium and Micro Enterprises are facing difficulties to compete with imported products, particularly own brands promoted by the foreign franchises.
- If manufacturing companies cannot compete with imported products on the local market, it is very unlikely that they will be able to compete in export markets. With global trade liberalization commitments and agreements signed with regional blocks, trade barriers are being dismantled. Manufacturing enterprises are facing serious competition from imports and some entrepreneurs have switched to trading activities in their line of business. The loose regulatory frameworks in some sectors do not create a level playing field between manufacturing and trading activities. In the food transformation sector for example, there are controls over some types of inputs like chemicals and food additives whereas imported finished products are not subject to the same stringent controls for the same inputs.
- Lack of critical mass is an issue both for the local market and export markets. Many SMEs do not have the capacity and expertise required to cover the full value chain functions. The current challenge for manufacturing SMEs is their survival. There is an opportunity for pairing entrepreneurs in difficulty with potential financial, technology or marketing partners to turn around the business. There are currently no public or private institutional platforms to facilitate this.
- The low electricity tariff paid by the manufacturing sector has worked as a deterrent to energy efficiency measures and for the installation of Solar PV systems for self-consumption due to a long payback period. This highlights the need for targeted measures for SMEs to enable them to reduce their energy consumption and self-consumption renewable energy.
- Against this backdrop, the policy of switching to green options, particularly if it does not improve the financial bottom line, is low on the agenda of manufacturing units especially MSMEs. Consequently, the core focus of sustainability of MSMEs is their economic viability. The challenge is to convey to MSMEs that there is opportunity to switch to products and services based on social and environmental norms which can pave the way to economic viability. This can happen through an enabling environment.
- The PNEE initiative and local capacity building in energy efficiency will influence manufacturing processes, including in SMEs, towards greener process options and a lower carbon footprint. There is however, less clarity on green products in terms of market opportunities, standards, inputs and expertise required. The 10-Year Master Plan for the SME sector should focus on the identification of potential green products and value chains.

## 5.5 Capacity building needs: Manufacturing sector

- The recourse to imported labour in a wide range of sectors demonstrates that these sectors no longer attract local labour but also to an extent results from the devaluing of trades.
- Micro enterprises in trades (carpentry, furniture manufacturing, jewelry, iron mongery) have declined in favor of imports and medium sized enterprises. One of the root causes is the dismantlement of the established practice of apprenticeship in Mauritius whereby skilled craftsmen would transmit their expertise to young apprentices over several years as from an early age of about 12. Compulsory schooling and the age threshold of 16 years to start working has eliminated this capacity building option which had the advantage of creating full fledged entrepreneurs and to perpetuate the tradition of master craftsmen.
- The vocational education system which has replaced the apprenticeship system has proved to create job seekers rather than entrepreneurs and employers complain about the quality of the training which requires them to re-train the employees.
- There is an opportunity to revive the apprenticeship system of capacity building which can be combined with formal literacy, numeracy and marketing courses to create well rounded entrepreneurs, which is the basic requirement to switch to eco-entrepreneurship. This approach to entrepreneurship development is more effective than adding entrepreneurship courses to existing vocational training courses.
- At the level of tertiary and vocational education level, there is a need to review the system to create more entrepreneurs. One of the Key Performance Indicators of publicly funded institutions should be their capacity to lead to enterprise creation and innovation in industry.

## 5.6 Conclusion and way forward

- There is a unique opportunity to give a new direction to the SME sector through mutually reinforcing interaction between the Switch Africa Green programmes and the political will to develop and implement a 10-Year Masterplan for the SME sector, as well as the Vision 2030.
- This proposition is supported by the following arguments:
  - One of the core issues to be addressed is to become more inclusive by supporting the development of local supply chains centered around SMEs.
  - Switching existing economic activity to green is another core concept where SMEs can be made to play a lead role.
  - Identification of new green products validated in terms of market opportunities, factor inputs and viability.
  - Linking SMEs to their counterparts in Africa through the networking component of SWITCH Africa Green could be an effective way to expand their economic space to address a critical hurdle to SME growth in Mauritius.

- With the weaknesses of academia, support institutions and the banking system to stimulate the growth of SMEs, there is a need for a new framework for high potential SMEs to emerge based on collaborative arrangements between entrepreneurs, technology providers, equity investors and marketing specialists.

## 5.7 Recommendations and Country projects

### **Review the legal and regulatory framework for green taxes and recycling of some types of waste by small operators**

- There are taxes levied on gasoline, which are transferred to the Consolidated Fund. A small fraction of these environment-related taxes should be channeled to a dedicated fund for SME-based recycling activities which are not viable in the absence of a regulatory framework or incentive measures. An Memorndum of Understanding (MOU) has been signed between the MCCI and Ministry of Environment, Sustianable Development, and Disaster and Beach Management (MoESDDBM) on waste recycling which will also include recycling of lamps.

A non-exhaustive list of small scale recycling activities are as follows:

- In the absence of legal requirements to recycle the mercury, most of the used fluorescent tubes and Compact Fluorescent Lamps (CFLs) purchased on the market and distributed by CEB find their way to the landfill. On a voluntary basis, some individuals are paying a small fee to recycle their used fluorescent lamps by one or two individual ‘voluntary’ recyclers. This is an opportunity for registered micro recyclers to be trained and equipped to recycle mercury and compensated by a small fee per unit recycled. Since fluorescent technology will eventually be phased out, this cannot be expected to be long term profitable activity; hence the short term incentive.
- A large number of glass jars from imported and local foodstuffs are currently trashed and landfilled. In parallel ,micro enterprises in the food sector import new glass jars to pack their products. There is an opportunity for a small scale/ regionalized activity for collection of jars, sorting per model, washing and cleaning to the same quality as new jars. Worn out jars and bottles could be separated to be used as an insulation layer in housing floors encased in concrete.
- To achieve logistics efficiency, the collection of used batteries, mercury wastes, and glass could be carried out by the same small operator to achieve a critical mass.

### **Review the legal and regulatory framework to create a level playing field between imports and local manufacturing**

- The legal and regulatory framework should be reviewed to enforce the same compliance requirements to traders as are applied to manufacturers particularly of foodstuffs. This should restore a level playing field between local manufacturing and trade including the

environmental compliance standards. Provisions of the Food Act currently under the responsibility of the Ministry of Health and Quality of Life should be fully enforced eventually through the collaboration of the relevant Ministries.

### **Streamlining and rationalization of the business support services to enterprises**

- The Industrial and SME Strategy 2010- 2013 and NES 2016 have identified lack of coordination among business support institutions leading to duplication and gaps as a major weakness. One of the most important gaps is in the selection of export-ready and nearly export-ready enterprises and the support measures needed for them to fully graduate to the export markets. Another weakness is in the area of Innovation, and Research & Development leading to commercialization of research results and new product development including green products.
- The association of SMEs has also reported capacity gaps in SMEDA whereas the capacity exists in other institutions not dealing with SMEs. There is a need to streamline and rationalize business support services and the optimal solution proposed by the association of SMEs is a unique body with one Managing Director and departmental heads to cater for all the business support functions across the different size segments. The grouping of experts under a single management will enable institutions to provide most of the services required by SMEs.
- This is also expected to lead to more efficient operations and lower overhead costs making the savings available for provision of specialized support services which may have to be outsourced outside Mauritius in areas where there are skill shortages.

## **Country Projects**

### **Development of a national eco-labelling framework and incentives for green certifications**

- This project was identified in the GEA report. Eco-labelling of sustainably produced products and services provides a market-based instrument to enhance access to international markets for Mauritian businesses. In turn, this provides an additional incentive for these businesses to adopt Green Economy strategies. Currently the Mauritius Standards Bureau (MSB) is developing an eco-labelling scheme with limited scope.
- As MauriGap and the Eco-label for Tourism (MS 165) are ready, there is now the need for a comprehensive National Eco-Labelling Framework to cover numerous industries and supporting campaigns to increase customer recognition of the label. The Eco-Labelling Framework should address specific manufacturing sectors to be defined. A sustainability index has also been proposed to reflect the performance of the most sustainable companies trading on the Stock Exchange of Mauritius.
- The development of eco-labels for sectors such as handicraft and transformed foods and certification of small operators will enable them to operate more sustainably in terms of getting a fair share of value from the supply chain. This is particularly relevant for women entrepreneurs who will have more flexibility working from home and focusing on creative tasks and actual production within a certified eco-label.

### **Giving a boost to the MSME Energy services and construction sector through an incentive framework to invest in building energy efficiency refurbishment**

- Green loan facilities such as the one set up by the Agence Française de Développement, allowing commercial banks to offer preferential credit facilities to companies investing in green industries, need to be enhanced. The legal framework for Energy Efficiency Building Code (EEBC) for new constructions and major refurbishments is being set up. It will become mandatory for these constructions to comply to building energy performance standards through a well-regulated 2-stage assessment and certification process with legal provisions including fines and denial of building occupancy for non-compliance.
- There is an opportunity to create a market for building refurbishment aiming at achieving better energy efficiency as was the case in Germany where the construction sector was revived through a similar scheme. This stimulation of consumption is a productive investment which leads to recurrent energy savings over the lifetime of the building.
- A group of 60 EEBC assessors have been trained through a GEF/ UNDP initiative executed under the Ministry of Public Infrastructure. What is required to trigger the market is the promulgation of the regulations, a mass information campaign and some form of incentive for voluntary refurbishment for existing buildings to comply to EEBC. Incentives could include lower municipal taxes and lower corporate taxes for companies. The right to offset electricity through self-consumption of Solar PV energy in the future could be tied to compliance to EEBC as a further incentive to reward the good performers.
- This project will directly benefit the SMEs in the construction sector including the 1,274 registered with SMEDA out of which 774 are officially operational. The new and sizable market will concern manufacturers of more energy efficient windows, blinds, awnings, roof insulation, radiant barriers, solar reflective paints, eco blocks, as well as certified EEBC assessors and consulting engineers to carry out the design and certification process.

### **Promoting green technologies and technology transfer services through service SMEs with an export potential**

- Technology transfer is crucial to low-carbon industrial growth. Important opportunities exist for technology transfer, including power generation technology, energy and water efficient technology, waste recycling and soil management.
- The authorities should widen the scope of SME service companies eligible for an SME development certificate beyond production of renewable energy to include Energy Audits, transfer of green technologies and consultancy services for switching SMEs to green.
- Experiences from emerging economies imply that most benefits are yielded from a two-pronged strategy in which technological transfers are complemented by localized innovation to help with adaptation and diffusion. Due to the weaknesses identified in the innovation support institutions, the expertise required should be sourced from qualified local and foreign experts.

- The funding required for such action could be provided from the savings made from the rationalization and streamlining of business support institutions which would still be responsible for monitoring the action to ensure there are no collusion between consultants and beneficiaries.
- The nurturing of a strong local capacity of sustainability focused experts is an outcome in itself as it can constitute the nucleus for an export-oriented service activity targeting sub Saharan Africa, particularly French speaking West Africa where there is less competition from English speaking experts.

### **Creation of an electronic platform for linking business angels, service providers and MSMEs**

- Due to difficulties for MSMEs, particularly startups in obtaining financing, one approach which has worked in the past is linking up angel investors with MSMEs. This provides not only a source of equity, but also provides the entrepreneur with a range of support ranging from mentoring to sector specific expertise. The platform can also include a database of SME-based service providers to SMEs. It has been suggested by the association of SMEs that any form of moderation of matchmaking should be carried out by neutral persons from business support institutions and academia.
- This platform could be a tool to enlist the support of the Mauritian diaspora who have made a career in Europe, North America or Australia and who would wish to retire to Mauritius and use their expertise to assist SMEs.

### **Revival of the apprenticeship system for trades**

- As detailed in the capacity building section, there is a need to reinstate the once established practice of apprenticeship so that parents who so desire can choose to entrust their 12 year old child to a master craftsman. Attempts at starting the practice at the current legal age of 16 for work have resulted in high drop out rates as it is easier to shape the character and attitude of children at the age of 12.

This initiative will have the following immediate benefits:

- It will address the social issue of primary schooling drop outs whereby children aged 11 or 12 in under privileged families are exposed to drugs and pilfering because they cannot work.
- Master craftsmen having difficulties to find qualified labor will get a relief. There should be safeguards to ensure that the children are not exploited.
- Experience has shown that the children usually ‘graduate’ as full-fledged entrepreneurs and master craftsmen and can immediately start their business.



## **Launching of a scheme for Solar PV self-consumption dedicated to manufacturing MSMEs**

- As highlighted in the challenges and opportunities section, there is a need for a dedicated Solar PV capacity estimated to 10 MW over 5 years to enable manufacturing MSMEs to become owners of a Solar PV system by paying their bill for a period of 5 to 7 years. Because of the relatively low tariff paid by the manufacturing MSMEs they should be allowed to offset 100 % of their consumption.

This scheme will:

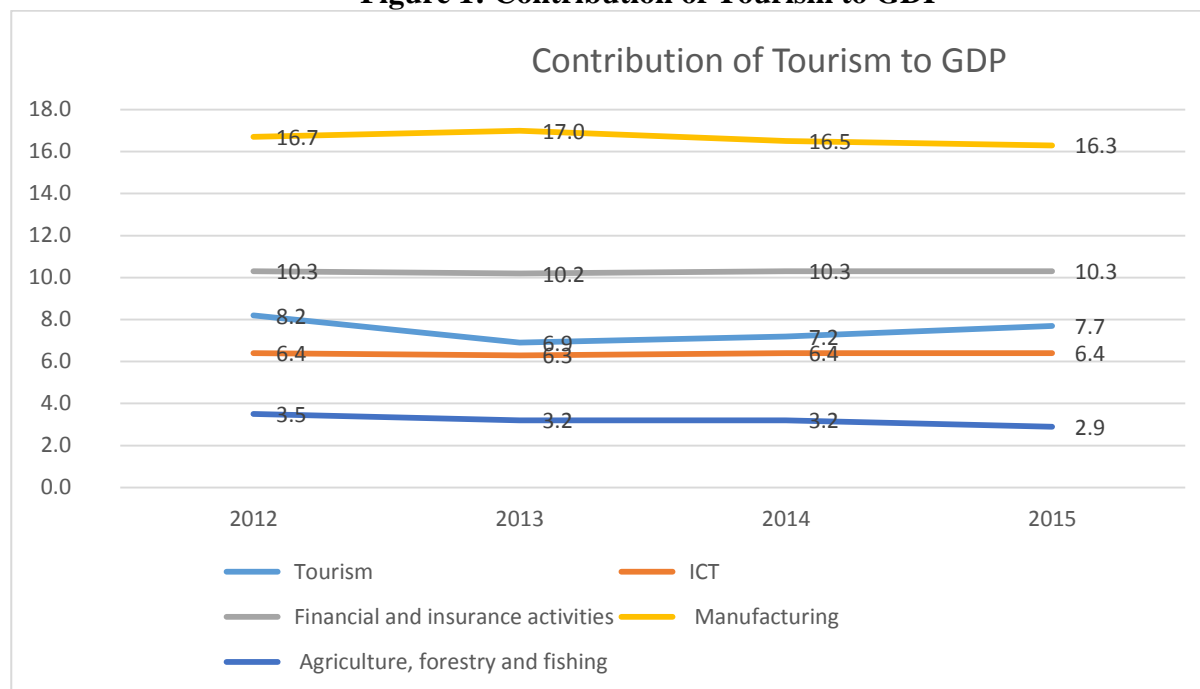
- Create a new class of small Installers who should be trained and certified in the installation of Solar PV systems.
- Enable the beneficiary SMEs to offset their electricity costs for 25 years. This can constitute a significant competitiveness factor as they can also switch to electric mobility which will also offset their fuel cost and enable CEB/Government to cut down their subsidy burden in the short to medium term.

## 6.0. Tourism Sector Analysis

### 6.1 Structure of the tourism sector

- Tourism, the third pillar of the economy after the Manufacturing and Financial services, contributes significantly to economic growth and has been a key factor in the overall development of Mauritius. It is the third largest sector by contribution to the national income after Manufacturing and Financial services. Its contribution to GDP has increased from 6.9 % in 2013 to 7.7 % in 2015.

**Figure 1: Contribution of Tourism to GDP**



Source: Statistics Mauritius: 2012 to 2015

- Tourist arrivals reached 1,038,968 (up by 4.6% as compared to 2013) and tourism earnings attained Rs. 44,304 (Million) in the year 2014. The number of tourist arrivals was forecasted to reach 1.1 million in 2015.
- The 2008 global financial crisis and the subsequent European sovereign debt crisis severely affected the sector. The problems were compounded with overcapacity and loss of competitiveness. Arrivals from European markets continued on a downward trend and was only partially offset by arrivals from emerging partners including China, India and South Africa.
- Global economic recovery and more aggressive marketing policies have led to a recovery of the sector in 2015 and 2016.

## 6.2. Review of policies, regulations, standards and instruments for promoting Green Economy

- At the start of the Tourism Industry in the 70's, competition from comparable destinations was limited and tourism arrivals was mostly driven by high-end beach resort hotels. Over the last decade, the competition from new entrants like Maldives, Seychelles, and Sri Lanka, and a large number of additional rooms from new hotels and guest houses, in the context of an economic turmoil in originating markets, all point towards the need to define a focused strategy for the sector.
- The Government projections in 2006 was 2 million tourist arrivals in 2015 as opposed to arrivals of just over 1 million in 2014. This has led to a subsequent stagnation of earnings per tourist. Mauritian tourism is becoming increasingly expensive, possibly reducing demand. Based on a price elasticity estimated at 0.5 by the International Monetary Fund (IMF) in 2012, a 10 percent increase in price translates into reduced demand between 2 and 5 percent. This highlights the need for a tourism strategy to inform policy making on the tourist arrival target.
- The Mauritius Standard (MS) 165 for sustainable tourism in Mauritius has been inspired from EcoMark Africa and the Global Sustainable Tourism Criteria (GSTC), taking into account the local specificities and context. The MS165 also specifies the requirements that tourism operators should meet to obtain an eco-label.

### **The scope of the standard is applicable to the following:**

- Accommodation (hotels, guesthouses, tourist residences)
- Restaurants
- Tour operators
- Tourist attractions (heritage, natural and cultural)
- Pleasure craft and related activities such as boathouses, scuba diving, helmet diving and parasailing

### **Benefits of the eco-label to tourism businesses**

- Enhanced corporate image
- Competitive advantage
- Diversified market and customer base
- Differentiated products and services
- Improved standing with staff, business partners, clients and wider stakeholders
- Increased business efficiency
- Compliance with environmental laws and regulations
- Improved environmental performance
- Maximisation of efficient use of resources
- Minimisation of waste

With a view to facilitating certification to MS165 of tourism businesses, the Mauritius Tourism Authority has developed a scheme to provide support to tourism businesses. The scheme is operational since 2015 and is managed by a Project Steering Committee set up at the level of the Tourism Authority. It provides a matching grant equivalent to 50% of the project costs, but not exceeding Rs. 44,000. The response has been poor as operators do not yet see the standard as a

marketing tool. MS 165 is competing with Green Globe and Green Key. MS165 is being reviewed to be aligned with the Global Sustainable Tourism Council requirements for recognition and accreditation to make it more attractive as a marketing tool.

With a view to incentivise companies to be MS 165 certified, the ceiling for the grant will be increased to around Rs150 000 to cover the certification and consultant cost.

In 2015, Government announced the preparation of Vision 2030 which will focus on the following four key areas:

- a) Addressing unemployment;
- b) Alleviating, if not eradicating, poverty;
- c) Opening up the country and new air access policies; and
- d) Sustainable development and innovation.

Although air access has always been a constraint for economic growth and the tourism sector in particular, a new air access policy is more relevant than ever. The tourism strategy and new air access policy are closely related and must be developed in parallel.

### **6.3 Assessment of the business environment – Investment Climate and Tax Incentive**

- The hotel branding is stronger than National branding which is currently focused on “Ile Maurice: c’est un plaisir”. With growing global competition for tourists, smaller hotels with weak or no brands derive less benefits from the country branding.
- There are several constraints on the potential of the coastal tourism sector to grow further in the medium term. There are few undeveloped coastal sites left with sand beaches and development on these sites will put additional pressure on land and marine ecosystems and further restrict access of the local communities to the beaches.
- During the post-2008 crisis period, over-capacity and over-indebtedness of the sector limited the capability of the industry to maintain its positioning as a low volume, high-value tourism destination and forced it to review its strategy towards more intensive mass tourism.
- The relatively restrictive air access policy that favors the local flag carrier also undermines the sector’s competitiveness. Growth is limited by declining competitiveness, as the country has slipped back from 53<sup>rd</sup> in 2001 to 58<sup>th</sup> in 2013 in the World Economic Forum’s Travel and Tourism Competitiveness Index (TTCI). According to TTCI (2013), of the Sub-Saharan countries, only Seychelles is listed in the top forty tourism destinations worldwide, where it was 38, entering the rankings for the first time at the top of the region. The strong focus of Seychelles on the environment and the substantial improvement in connectivity to markets though the stake of Etihad in Air Seychelles have contributed to this success.
- To give a boost to the tourism sector, Government announced in 2015 the re-structuring of the Mauritius Tourism Promotion Authority for greater flexibility and effectiveness to meet the objectives set for the tourism industry. This was accompanied by a substantial increase in the budget from Rs390 million to Rs560 million.

- A nation-wide tree planting campaign has been re-launched for the embellishment of the motorway and the main roads. This initiative aims to increase the area of green space in the country, thus reducing the heat island effect and support climate change mitigation.
- The tax incentives for the promotion of Green and Sustainable Development are: Accelerated Income Tax Depreciation Provision for Green Investment, Exceptional accelerated annual allowances were introduced in 2013 and made permanent in 2015 in respect of:
  - landscaping and other earth works for embellishment purposes (50% straight line) and,
  - green technology equipment (50% straight line).
 Green technology equipment is defined as capital expenditure (excluding passenger car) on renewable energy, desalination plant, composting equipment, pollution control equipment, water efficient plant, energy efficient equipment, etc.

## **6.4 Challenges and opportunities: Tourism sector**

### **Africa / Regional strategy**

- The SADC Draft Regional Green Growth Strategy and Action Plan for Sustainable Development, 2014 regulates the development of the tourism sector in the SADC region by the 1998 Protocol on the Development of Tourism, which aims to promote the sector as a key driver of sustainable socio-economic development through the improvement of services and infrastructures in an environmentally sustainable, inclusive and resource efficient manner. However, due to its isolation from the mainland SADC countries, it might be more difficult for Mauritius to benefit from such initiatives.
- In the context of the Africa strategy, Mauritius has the opportunity to position itself as a full value chain exporter of tourism services to the targeted countries in West Africa where there is growing demand for business hotels. This export of expertise ranges from project development and financing to design and construction of hotels and training of hotel staff. This constitutes an expansion of the limited economic space of Mauritius in an area where Mauritians can add value to sustainable development in sub-Saharan Africa, while ensuring the sustainability of its construction services sector which contributed to the development of the tourism industry over 4 decades.
- Cooperation among Indian Ocean tourism destinations has increased in the past year, largely through the Vanilla Islands Organization. Mauritius could further benefit from the synergies it creates, including marketing in emerging destinations, promotion of cruise tourism to the region, and cooperation in other areas such as training standards, and air transport. Of specific interest is the possibility of capturing a larger share of the growing Indian market through the Mauritius-Africa- India corridor.

### **Ocean Economy**

- The ocean economy will serve as a major platform for promoting marine-based tourism and leisure activities. Tourism and ocean-based leisure will be given a new impetus, with diversification of the tourism product and a bigger focus on cruise tourism and sea sport. In

order to increase the number of cruise passengers, in the short term to 20,000 and in the medium-term to 50,000, Mauritius is envisaging to invest in the construction of a modern cruise terminal by 2016 with a view of improving facilities provided to embarking and disembarking cruise passengers. The benefits that the economy will reap from a fully dedicated cruise terminal are significant, especially to the tourism and port industries, with enormous multiplier effects. There are more than 5,000 jobs that are currently available in this field.

### **Linkages with Agriculture**

- Despite efforts being pursued by the Ministry of Agro-Industry and Food Security for resource efficiency and conservation in the sector, sustainable agriculture is still in its infancy. The Maurigap certification and efforts to develop the ‘Agriculture Raisonnée’ are both initiatives which will provide opportunities to increase procurement by the tourist sector from local producers. Successful and responsible food sourcing requires cooperation. To achieve the sustainability targets, the agri-food supply chain will need to work closely with tourism enterprises to ensure that they understand why and how the agri-business has committed to new standards of responsible environmental and social performance. Government will also be required to support the suppliers and incentivize good practices in the agricultural sector.
- The proposal for the setting up of Agro-ecological zones outlined in the chapter on Agriculture should devolve into early consultations between the pack houses, small planters and the Association des Hotels et Restaurants de l’Ile Maurice (AHRIM), with the collaboration of the Ministry of Agro-Industry & Food Security, to lead to successful sourcing by the hospitality industry on a localized basis. This will contribute to the sustainability of the tourism sector.

### **6.5 Capacity building needs: tourism sector**

- There is competition from cruise lines and hotels elsewhere in the region for human resource which may lead to skills shortages with impacts on the quality of service, increasing costs, and the need to hire foreign workers. The country’s principal tourism training institute, Ecole Hotelière Sir Gaëtan Duval, only meets half of the demand for its courses (1,500 slots for 3,000 applicants). These call for strategic investment in training to increase the quantity and improve the quality of the country’s tourism workforce and position the country as a regional training center for the African region.

### **6.6 Conclusion and way forward: Tourism sector**

- There are 2 fundamental realities which govern the global tourism sector:
  - The economic situation in the originating countries has a strong influence on the choice of a holiday destination, which should dictate a more outward looking focus of the Mauritian tourism strategy.
  - Being a long haul destination, Mauritius must build unique sustainability features to reinforce the country’s branding around local tourist destinations and provide compelling reasons to visit and revisit the country.

There is an opportunity to reinforce the linkages with the agricultural sector to enhance the local content of the Mauritian product. Another linkage opportunity is with the services and construction sector to improve the energy efficiency of hotels and restaurants.

## **6.7 Recommendations and country projects**

To address the constraints that are limiting the sector's growth potential, the following actions are recommended:

### **Develop a new national tourism strategy**

- In line with the key recommendations of the World Bank Mauritius Country Diagnostic Report 2015, it is now timely for Mauritius to develop a new national tourism strategy that would confront current challenges and opportunities. At the core of this strategy formulation, is to carry out a Country Sustainability Carrying Capacity study to assess the optimum tourism arrival target, taking into consideration the yield per tourist, optimal hotel occupancy levels, and environmental and social impacts, including impact on the local community. The objective would be to inform the tourism strategy, including the amount and type of growth in accommodation supply by providing a comprehensive, integrated, and resilient physical and environmental plan. It could also address key issues such as positioning of the destination, niche product development, market diversification, air access policy and regional collaboration initiatives, while ensuring private sector participation in building sustainability, industry resilience, productivity, and quality. This will lead to more informed policy decisions in terms of the tourism strategy and tourist arrival targets.

The national tourism strategy should identify the parameters for an air access policy and strategy which would contribute to a sustainable tourism industry. As the experience of Seychelles shows, economic sustainability of tourism in small remote islands is closely linked to air access policies and connectivity with markets. Mechanisms to improve air access should be considered, starting with a re-evaluation of the current bilateral air service agreements to identify constraints. The strategy could also serve to assess the business model for Air Mauritius in the context of changing industry dynamics.

### **Reinforce tourist-based attractions**

- To reinforce the country branding and lead to wider community benefits, there is a need for a national project to develop local destinations which can constitute full-day trips for tourists to enhance their experience of Mauritius. The Local Authorities in Mauritius do not have authority on a number of factors to transform a region into an integrated tourist destination. Potential sites to be exploited where public and private sector institutions have started researching are the land and lagoon areas around Mahebourg, Port Louis-Louis, and Le Morne/ Chamarel site. A high level of coordination with a high profile project champion is required for such a project to materialize, as it requires detailed design in terms of infrastructure for itineraries, upgrading of roads, pavements, street lighting, day and night signage, security, and provision of information kiosks amongst others. The key to success of such a project is transparent and abundant supply of information to tourists through available technological applications like wifi and mobile apps, and traditional modes of providing information like through an information kiosk. The accessibility to the site from hotels should also be improved by providing the framework for appropriate taxi rates to the

site to avoid the current system operated by taxi drivers which deter tourists from using taxis. The local community should be fully involved and should understand its key role in promoting the tourism industry, and how they will benefit from tourist spending. The value addition to local destinations centered around historical, cultural, culinary, heritage, and environmental features is at the core of the strategy of adding more substance and product differentiation to the Mauritian destination.

### **Reinforce linkages with agriculture**

- An opportunity to be tapped is to reinforce the linkages with the sustainable farming initiatives localized within the region of the hotel and to involve local communities. This is an area where the SWITCH Africa Green target sectors overlap and can have a symbiotic relationship. Specific areas of collaboration include:
  - Sourcing of livestock and agro products from local Agro-ecological zones complying with environmental and fair trade practices
  - Agri-tourism as an inland tourism activity for tourists to visit Agro-ecological zones and tropical fruits orchards

### **Reinforce linkages with energy services / construction sector**

- Most of the large hotel groups already have a form of sustainability policy and have invested in some measures to reduce their energy consumption including through the PNEE energy audit initiatives. The large hotels also plan for major refurbishments every 7 to 10 years which will henceforth require them to comply to the Energy Efficiency Building Code (EEBC). The small hotels, guest houses and restaurants refurbish their facilities less frequently and may not have to comply to EEBC if less than 50 % of the envelope is affected. With rising temperatures, poor envelope design and low cost air-conditioners, their electricity bill will increase as most of these small operators pay the highest tariff of Rs 10 per KWh.
- An energy efficiency oriented building refurbishment scheme would enable a large number of small establishments in the tourism sector to reduce their specific consumption while also giving a boost to the ailing building services and construction sectors. This scheme would enable government to establish a missing link between the Energy Audit initiative and the Energy Efficiency Building Code (EEBC) being implemented separately by the Ministry of Energy and Public Utilities and Ministry of Public Infrastructure respectively. The Energy Audit initiative targets existing buildings and the EEBC targets new buildings and major refurbishments. The scheme will cater for the large existing stock of buildings and will include a combination of both energy auditing and building retrofit to comply to the EEBC on a voluntary basis even though the code may not require them to do so.

As an incentive to carry out the Energy Audit and voluntary refurbishment to comply to EEBC, a permit to offset up to 50 % of their electricity consumption through a roof top Solar PV system could be granted on a priority basis in future net metering schemes. This would enable them to mobilise green loans and more easily payback through the immediate savings made on the electricity bill.

In order to reinforce the impact of green branding, the Solar PV permit could also be tied to the hotel that is seeking to be MS 165 certified.



## 7.0. Cross Cutting Issues

### 7.1. Energy and energy efficiency as a cross cutting issue

- The new Government Programme reaffirms Mauritius' commitment to achieving at least 35 percent of electricity sourced from renewable energy by 2025, from today's level of less than 20 percent (GoM, 2015). In recent years, renewable energy as a percentage of total energy used has fallen, primarily due to increased overall electricity demand, and low renewable energy growth. However, Government is committed to reversing this trend. According to the Green Economy Assessment Modelling Analysis, achieving 35 percent of energy from renewable energy, combined with efforts to improve energy efficiency, is expected to result in savings on fuel imports of Rs 4.5 billion per year between 2014 and 2025.
- A Long-term Energy Strategy for 2009-2025 and an Energy Strategy Action Plan 2011-2025 have been adopted by the Government of Mauritius. The main targets in this strategy are:
  - Increase the share of renewable sources of energy in electricity supply (from about 20 percent presently to 35 percent in 2025);
  - Improve energy efficiency and conservation in all sectors through demand-side management measures (with targeted energy efficiency gains of 10 percent by 2030 over the 2008 baseline); and
  - Create a financially-sound and self-sustaining modern electricity sector within a transparent and fair regulatory environment.
- In the context of switching economic sectors to green, renewable energy production targets should not be viewed in isolation from the utility point of view using a least cost approach. It has been shown across the 3 sectors that there are significant net socio-economic benefits of adopting a holistic and integrated view of renewable energies as follows:
  - In the agriculture sector, through the concept of Agro-Energy-Food hubs as a sustainable solution for livestock waste processing and sustainable small holder farmers.
  - In the MSME sector, to enable long term offsetting of the electricity consumption as a competitiveness factor and to lower the subsidy burden for Government.
  - In the tourism sector, as an incentive to voluntarily switch to greener buildings.
  - The adoption of renewable energy policies in the above-mentioned 3 sectors will contribute to nurture an emerging MSME energy service sector with an export potential in Sub Saharan Africa.

### 7.2 Eco labelling and standards

- With the level of institutional support available and Government commitment, there is an opportunity for eco-labelling and standards to open access to niche markets. There is a need for targeted support to ensure that operators, particularly micro and small enterprises, adopt the standards.
- Experience with other projects in Mauritius has shown that high uptake of such initiatives happens when there are national schemes and top-down projects, as there is a phenomenon of emulation among entrepreneurs. This explains the focus on country projects aiming at demonstrating the benefits by pioneers who will be followed by others.

- The country projects are designed in such a way to also ensure that eco-labelling and standards do not constitute an obstacle, but give a boost to the enterprise.

### 7.3 Water efficiency

- Improvements in water efficiency are needed in order to deal with increasing demand for water. The GEA report outlines several options that Government could pursue in this sector, including increasing investment in the pipe network, meter renewal, rain water harvesting systems, micro-irrigation systems, a new water tariff policy for cost recovery, and sustained water conservation awareness campaigns. As per GEA modelling, such efforts to tackle water use, if successful, would reduce consumption by 16.7 percent compared to the business as usual scenario. It is estimated that avoided water losses would generate savings of around Rs858 million between 2014 and 2030.
- In recent years, tourism has become increasingly energy efficient, with a reduction in energy intensity of 53 percent between 2002 and 2009. The results of the GEA modelling exercise demonstrate that further investments in energy efficiency would reduce water costs by 20 percent by 2030. Actions on energy efficiency would also generate economic savings for the industry. Finally, increased green tourism actions can attract visitors who value such measures.
- The policy recommendations and country projects aim at addressing water efficiency:
  - In the agricultural sector, the measures proposed aim at optimal recycling of livestock waste and wastewater from livestock operations. The liquid digestate serves as a fertilizer and contributes part of the water requirements.
  - The grouping of small farmers around the concept of a pack house in a contract farming arrangement will enable FAREI to train farmers more effectively in water efficient growing techniques and for small farmers to invest in equipment.
  - In the manufacturing sector, the national energy efficiency voluntary building refurbishment scheme by energy service MSMEs will include a rainwater harvesting and water recycling component. This measure will target the stock of existing houses estimated at 400,000.
  - In the tourism sector, the voluntary hotel refurbishment scheme will include a water efficiency component.

## **7.4 Eco innovation**

- Innovation, including supply chain innovation, is one of the key weaknesses across sectors in Mauritius. Due to the limited capacity of support to institutions and local experts in eco-innovation, targeted support by experts have been recommended to enable enterprises to adopt latest appropriate technologies for products, processes and agro technologies.

## **7.5 Sustainable trade**

- The skewed distribution of land resources in agriculture, the control of distribution chains by large corporates and the large share of market controlled by large hotels confirm the importance and relevance of sustainable trade in Mauritius.
- Sustainable trade is a core issue in the agricultural sector. The proposed approach to address this issue is a transformation of the supply chain power of small holder commercial farmers by grouping them in a collaborative relationship in a medium sized entity.
- In the manufacturing sector, the focus is on restoring a level playing field between trade and manufacturing. Another dimension of sustainable trade in the manufacturing sector is access to critical resources. It is proposed to tackle this issue in innovative ways like angel investors, a democratisation fund and direct support to mobilise specialist expertise.
- In the tourism sector, measures aim at reinforcing the country branding and devising a tourism strategy to improve the competitiveness of the sector while creating sustainable economic space for small operators.

## 8.0 The Rodrigues case

### 8.1. Situational analysis

- The Sustainable Integrated Development Plan for Rodrigues (SIDPR) 2009 was developed by KPMG with inputs from 20 sector specialists and through a consultative process, including working sessions with key decision makers. The SIDPR identified 11 root causes of issues, most of which are still relevant and prevalent to date:
  1. Inadequacies in planning, management, monitoring and evaluation
  2. Economic/Investment climate and the circle of opportunities (low Return on Investment (ROI) and limited opportunities for gainful employment)
  3. Education & human resource development
  4. Law enforcement, including ineffective protection of land and coastal zones
  5. Resource mobilization and availability, including unsustainability of social aid and safety nets
  6. Current system of autonomy and devolution of power, including ability to leverage funding for development
  7. Initial conditions/endowment and nature linked to the constraints of a typical remote small island
  8. Water stress
  9. Degradation of the environment and depletion of the natural resource base
  10. Specific societal phenomena
  11. Specific sectoral problems, including decreasing acreage and production, overfishing in the lagoon, frequent market failures, low quality norms and food safety strategy, and lack of competitiveness of the handicraft sector.

A 20-step remedial plan was proposed, which was, however not fully implemented.

- During the elaboration of the Maurice Ile Durable Policy, Strategy and Action Plan (MIDPSAP) in 2011, a 2-day consultative meeting was organized in Rodrigues with all stakeholders where the same root causes were reported again.

The Poverty Environment Initiative (PEI) report attempted to integrate new aspects of environmental sustainability and pro-poor green growth for the review of commitments and actions generated under the Sustainable Integrated Development Plan for Rodrigues (SIDPR), MIDPSAP, Rodrigues Regional Government Programme 2012-2017, Rodrigues Budget Speech 2014.

The 3 reports – PEI, SIDPR and MIDPSAP – which were produced within a couple of years interval, consistently show the same root causes of constraints to sustainable development and economic development in general. This shows that apart from marginal improvements in the economic sectors, the fundamentals have remained unchanged.

Rodrigues is behind the national average on every economic and human economic indicator.

**Table 11: Poverty and unemployment rates Mauritius and Rodrigues**

<b>Indicators</b>	<b>Mauritius</b>	<b>Rodrigues</b>
Poverty Rate (as a % of population)	1%	19.5%
Unemployment rate (as a % population)	7.9 % (2015)	25 %

Source: SM Mauritius in Figures 2015 for unemployment in Mauritius.

There are no official statistics on poverty and unemployment in Rodrigues. The data is from the Concept paper- Youth Volunteer Corp Project.

In Rodrigues, most of the unemployed people are aged between 20 and 29 years. The following tables are extracts from the Housing and Population Census 2011 on Rodrigues

**Table 12: Distribution of unemployed per age category in Rodrigues**

<b>Total registered unemployed (first job seekers)</b>	<b>1,343</b>	<b>Total Registered Unemployed</b>	<b>2,030</b>
<b>20 – 24 years</b>	<b>506</b>	<b>20 - 24</b>	<b>642</b>
<b>25 – 29 years</b>	<b>226</b>	<b>25 - 29</b>	<b>390</b>
<b>Percentage registered unemployed 20 – 29 years</b>	<b>55%</b>	<b>% registered unemployed 20-29 years</b>	<b>51%</b>

Source: Statistics Mauritius, Housing and Population Census 2011 on Rodrigues

Gender issues noted include feminization of poverty and domestic violence. Migration of men to Mauritius have put additional pressure on women who are not eligible for support because of their married status. Measures proposed address the gender dimension.

- The figures for unemployment do not reflect the real picture, because there is an estimated 40,000 Rodriguans who are either settled or are working in Mauritius. These are not only made up of the manual class, but also include some technicians and cadres. There is also a number of Rodriguans who have emigrated to Europe, Australia/New Zealand and North America, which represent a diaspora with strong ties to Rodrigues and a potential for contribution to the sustainable development of Rodrigues given an appropriate framework.

- The problems in Rodrigues are well documented and there have been a number of recommendations in studies and consultancies over the past decades. The reality is that much of the focus has been on establishing frameworks and enabling systems, with a view to implementing projects. There has, however, been some good progress achieved in areas like quality of transformed agro-produce.
- Taking into consideration the size of Rodrigues and the relatively small numbers involved, our approach to sustainable development is to build on the achievements to date to directly address the most critical issues through prototyping and pilot projects in focused sectors. This approach can lead to a validation and formalization of the regulatory frameworks based on demonstrated concepts and demand-driven policy orientations.
- Another dimension to the approach to defining the policy orientations in Rodrigues is to introduce innovation in existing sectors, based on validated and sustainable demand. Innovations which can concomitantly address all the issues of poverty alleviation, youth unemployment, brain drain, degradation of land and marine eco-systems and thus lead to a higher growth path.
- One fundamental lesson learnt by the local administration is that the Rodriguan entrepreneur is very individualist. Past attempts at grouping them around collective projects through associations and cooperatives have failed. The solutions proposed will take on board this constraint.
- One of the main constraints to entrepreneurial growth and democratization of the economy is access to finance. The banking system in Rodrigues is particularly risk averse and the result is that entrepreneurs who succeed in securing loan funding are those with collateral or cash deposits or civil servants with a guaranteed job and doing a second informal business in parallel. The latter has become a model for the youth to emulate, as it offers a secure Government job with a complementary source of revenue. This is a barrier to SMEs as this category of informal entrepreneurs tend to maintain a marginal activity like owning some cattle and cannot grow their business to become full-fledged and successful entrepreneurs.
- A large section of the population thus remains in the informal sector locked in a poverty trap. Experience from recent projects has shown that individuals when given a push do succeed as entrepreneurs and thereafter can manage on their own and expand their business.

## 8.2. Agriculture sector

### 8.2.1 Situational analysis

- The economy of Rodrigues is still predominantly based on agriculture, animal rearing and lagoon fishing. The bulk of the native forests has disappeared since the 1970's as a result of using wood as a major source of fuel up to the 1980's and of subsistence farming that laid emphasis on the rearing of cattle, sheep, and goats.
- Agriculture consists essentially of the production of fresh vegetables and staple food, i.e. maize, onion, sweet potato, red bean, and garlic. Key products mainly exported unprocessed to Mauritius are lemon, chilies, honey and octopus, which also represent the products with a good potential for value addition. In 2012, 1,104 units of cattle, 3,366 units of goats, 1,442 units of sheep, 25 units of pigs, and 7,550 units of poultry were exported to Mauritius representing the surplus after local consumption.
- The disappearance of the native forests and subsistence livestock farming practices on the forest land over a period of 3 decades has led to overgrazing, soil erosion and lagoon siltation. The problem has been exacerbated due to the following phenomena:
  - At the initial stages there were a few livestock farmers with about 40 to 50 heads of cattle each. As these farmers retired, their male children (from around 7 to 8 total children) emulated the parental model with about 10 to 15 heads each as reported during the stakeholders meeting with the Forestry Department. This model is clearly unsustainable with the limited grazing land.
  - There has been a shift of focus from dairy to beef cattle for export to Mauritius, which requires more grazing because of the shorter lifetime of beef cattle.
  - The good intentions of the Rodrigues Regional Assembly (RRA) to discourage cattle has led to a shift to rearing of sheep and goat for which there is a growing market in Mauritius for rituals and the festive season. Sheep and goats can thrive on poorer quality grass and graze even closer to the ground.
- Possession of livestock is deeply rooted in the pastoral tradition of the people of Rodrigues, where owning large numbers of cattle is considered a sign of wealth. In 2011, some livestock in common pastures died due to a severe drought. Mauritian traders purchase livestock during the dry season from October to January, when helpless farmers prefer to sell at a very low price rather than to lose their animals to famine. Soil erosion and environmental degradation from overgrazing also affect the lagoon and the coral reefs which are the habitat for marine entities.
- In order to address this serious issue, the RRA has drafted a new legislation on cattle walk areas to restrict cattle to enclosed spaces with cut and carry fodder cultivation for feed. Due to past unsuccessful attempts and the deep rooted practice of live cattle kept as an asset, concerns have been raised about the effectiveness of this proposed approach.
- There are plans to rear the black pig of Rodrigues as a local specialty. However, the limited underground water resources in Rodrigues stand the risk of being polluted from pig waste which is currently discharged untreated. At the same time the loss in soil fertility, which may be due to the use of some chemical fertilizers over about 2 decades, poses a threat to subsistence farmers in the context of the orientation of Rodrigues towards sustainable and

organic type farming. There is consequently an opportunity to collect and add value to all sources of livestock waste to contribute towards restoration of soil fertility and organic farming.

## 8.2.2 Proposed solutions

### **Centralized livestock management with value addition to waste**

- Taking into consideration the situational analysis in 8.1 and 8.2.1, the core problem to be addressed is to eliminate the practice of free range cattle in an inclusive and sustainable manner. During the stakeholders meeting, it was reported that the solution of centralisation of cattle has already been proposed in the past but has not been implemented. The solution proposed now is based on grouping the existing 7,500 heads of cattle in feedlots and sheds to be fed with rations of locally produced fodder. This is a fundamental change in livestock practice, which according to policy makers and support officers can only work if the individualist entrepreneur approach is maintained.
- The cost structure will change as there will be costs involved in cultivation, harvesting and transport of fodder like common acacia, and elephant grass. The main innovation in the proposed approach is to let individual farmers manage their herd of about 50 cattle in a shed or feedlot at the bottom of valleys with an allocation of land to grow fodder further uphill in the valley.
- The RRA policy of creating a high value label Rodrigues meat which can be certified grass fed and thus fetch a premium price in the Mauritian restaurant and hotel supply chains can contribute to generating higher returns from a lower number of heads, thus putting less pressure on fodder and water resources. A farm size of 50 heads makes it easier to manage traceability and certification process than widely dispersed herds of a few heads to 15 heads.
- Value addition to waste has already been validated at Atelier Frere Remy where waste from about 25 pigs generates the cooking gas for about 60 daily midday meals. Processing of waste on individual farms is only possible if there is a market for cooking gas within about 100 m. Cooking gas being over 100 % subsidized make this option less attractive.
- The innovation proposed lies in locating about 8 to 10 such individual farms in such a way that the waste can be gravity fed to a central Anerobic Digester (AD) to produce electricity and organic manure with a sale value leading to profitable operations for the biogas Waste to Energy (WTE) and liquid manure plant. The AD plant of a capacity of around 50 KW must be professionally managed to consistently generate revenues. A compensation formula must be worked out to ensure a fair distribution between the farmers supplying the waste and the entrepreneurs operating the WTE plant, which must be the younger generations of Rodriguan engineers and technicians trained to operate biogas plants.
- One solution is for the waste to be provided free in exchange of the liquid fertilizer and a small fraction of the electricity revenues depending on the tariff obtained from CEB. The balance of the electricity revenues could then pay for the capital, financing, operation, and maintenance costs of the biogas plant.



- An alternative approach in line with the individualist entrepreneur spirit would have been to have much smaller individual digestors at each farm and install a gas collection network to process the gas into electricity centrally. Due to the risk of gas leakage and the specialized expertise required to optimally operate biogas digestors, this option is not feasible. The main risk is that the onus of biogas production will be on the individual livestock farmers, who may still enjoy the benefit from the liquid fertilizer produced even if biogas yield goes down affecting the electricity components which is an important revenue source for this sustainable waste processing option.
- This sustainable management of waste will ensure an optimal management of water resources by collecting all the livestock waste and waste water in a leak proof PVC piping network. The digestate (liquid residues fertilizer at 4 % solids after digestion) management can be adapted to the water situation: in case of adequate rainfall, the digestate can be stored in a covered tank to be applied when the rain stops. Applying liquid fertilizer during rainfall leads to leaching of nutrients particularly in sloping terrains in Rodrigues. Application of liquid fertilizer during dry periods brings both water and nutrients which can be optimally absorbed by the plants.
- The second innovation lies in the sources of local feedstock, which are more sustainable than the current practice of grass pastures.
  - Instead of growing prairie grass, elephant grass and common acacia should be grown along contours on sloping land to act as natural barriers to soil erosion. The use of pumpable digestate fertilizer ( 4 % solids) from anaerobic digestion has been shown to achieve yields of elephant grass of at least 120 tons per ha in Mauritius and should be validated in Rodrigues.
  - Introduce coconut leaf based feed which is made by very finely chopping coconut leaves/branches, mixed with molasses and some protein rich complement. This new feed will not only relieve the pressure on land resources but will also generate a revenue stream for the coconut value stream (filière) which is being proposed as an alternative source of livelihood for fishers to relieve the pressure on lagoon fishing. Use of coconut leaves as the only cattle feed has been validated for years on a small atoll in Seychelles on a herd of 80 cattle. This could enable a community of fishers to engage in cattle rearing with a small complement of protein rich fodder like acacia.
- The current size of the cattle herd is about 7,500. Assuming a target of 7,200 in the high value / lower volume strategy and cluster size of 400 heads per valley (8 individual farms of 50 heads each), 18 such clusters with a total of 144 individual farms of 50 heads each are needed.
- It is estimated that collecting pig waste from 400 pigs through pipes where feasible and using liquid manure delivery tanker backhaul trip can contribute to about 10 % of the feedstock. Another source of livestock waste is sheep and goat manure which can be more easily collected solid and delivered to the biogas plant against a fee. Collecting 75 % of the waste from 800 sheep/ goat also in feedlot systems can contribute about 10 % of the feedstock. The total from cattle, pig and sheep/goat represents a biogas potential of 50 KW in each valley
- In terms of contribution to firm power, the 18 clusters represent 900 KW of firm power which represents less than 10 % of the load in Rodrigues. Biogas can be stored for a few

hours in the gas collector and the negotiations with CEB could include a form of controlled dispatching whereby the biogas plants could be shut down in case of excess wind power off peak at night and started again during normal and peak hours. Addition of 50 KW Solar PV at the biogas plant would also enable the biogas plant to generate additional revenue enabling the biogas engines to be shut down during peak sunlight hours. Instead of a 50 KW generator, a 63 to 75 KW generator can be installed to cater for operation over a shorter period of time when it suits CEB better to match intermittent RE with the load profile.

- The farm waste based biogas being a dispatchable source of firm power is an important component in the energy mix for Rodrigues to achieve its target of 100 % renewable energy by 2030 without increasing the pressure on biomass resources. Anaerobic Digestion is the only technique of energy from biomass or waste which does not burn the carbon but converts most of it (methane contains only one molecule of carbon) into fertilizer which leads to a natural form of carbon sequestration when applied to the soil.
- The third innovation lies in a bankable business model for the biogas plant which is based on a 20-year power purchase agreement by CEB, which also paves the way to green loans and concessionary funding. The project should however, mandatorily employ young graduates and technicians in engineering to achieve professional management. This will constitute a high-tech career opening for the younger generation to get empowered in the Rodrigues green strategy. It is expected that such a scheme will also create the opportunities for attracting qualified and experienced Rodriguans, currently under-employed elsewhere, to settle back in Rodrigues.
- The fourth innovation lies in the funding model for the project. It is proposed to transform this initiative into a project of national interest by creating a Democratization Fund made up of CSR contributions, investments by small holder Rodrigues, diaspora Rodriguans in Mauritius and elsewhere and citizens of the Republic in general. This fund with a low but guaranteed return on investment, (much higher than bank savings rate) can provide the required level of cash equity to mobilize the bank funding.
- Instead of focusing on enforcing compliance to a regulation on cattle walks, which is bound to create resistance, the project will focus on pulling the sector towards a modern and sustainable waste processing technology, and democratizing the economy while also constituting a 'Returning Rodriguan' scheme.
- The Foot and Mouth Disease outbreak in August 2016 has caused an unprecedented crisis in the livestock and economy of Rodrigues, and to a lesser extent in that of Mauritius. The crisis has exposed the socio-economic vulnerability of farmers. The compensation paid by Government for culled animals does not address the issue of livelihoods of livestock farmers faced with a ban of 3 years on all exports of livestock. There is an opportunity for an accelerated implementation of the SWITCH Africa Green recommendations on biogas from livestock waste in Rodrigues, given the situation that has been created by the Foot and Mouth Disease. Once vaccines and isolation of animals bring the epidemic under control, the farmers will be able to reconstitute their herds. These herds could be centralized. Biogas plants can be built within 6 months and operations could start within a year from now. This one-year time frame provides a window of opportunity for the epidemic to be controlled and the herd size stabilized so that farmers can derive revenues from sales of electricity and manure during the ban period. The different stakeholders concerned, including the RRA,

CEB, the Ministry of Agriculture and Ministry of Finance should work out the modalities for implementation. This would be a sustainable approach to addressing the Foot and Mouth Disease crisis.

### **Coconut value stream as an alternative livelihood for fishers**

- The sustainable solution for addressing lagoon overfishing is to provide an attractive and long term alternative livelihood to the fishers and their descendants. The elimination of Bad Weather Allowance (BWA) has been recommended in past reports. This approach can only be sustainable if accompanied with credible alternatives.
- The solution proposed is an agricultural activity which is close in nature and in proximity to fishing in the lagoon. It is proposed to develop large scale plantations of coconuts inland along the coast but not in beach areas visited by the public and tourists. Coconut is a long-term crop which requires very low maintenance. It has a number of revenue streams in its life cycle and is in line with the RRA strategy for agriculture.
  - The leaves are harvested and used as cattle feed within a cattle cluster equipped to convert them into cattle feed. This constitutes a triple linkage which reinforces the integration between the lagoon fisheries protection, agriculture and livestock sectors.
  - Coconuts are harvested periodically and sold to specialized coconut processors which convert them into virgin coconut oil for export to niche health market as a high value, low-volume and non-perishable health food in high demand. The regulatory requirements to export virgin coconut oil to the United States (US) under African Growth and Opportunity Act (AGOA) should be explored further.
  - The coprah residues, after extraction of the virgin oil, constitute a raw material for the food processors for transformation into biscuits, sweets and other local delicacies to be developed. Any excess coprah residues can be sold to the individual farms as animal feed.
  - The coir (coconut fibres around the shell) could form the basis of a new material in the handicraft and construction sectors. There is a leading research centre in India which can provide assistance to transfer the appropriate technology for the scale of operations in Rodrigues, for converting the raw coconut halves into fibres, and subsequently ropes, fine tapestry, mats, and innovative building materials like insulation under ventilated steel roofs. The waste choir can be used for mulching in sustainable agriculture.
  - The shells are already used as a material for handicraft. The excess can be sold to a local biomass gasification plant for conversion into energy
  - Coconut milk can become the Rodriguan health drink of excellence to replace most of the imported softdrinks building the image of Rodrigues as a junk food free island.
  - Coconut plantations provide an all year round source of nectar which could enable the owners to invite beekeepers to bring their hives against a fee when other sources of nectar run dry. This will improve the quality of honey by eliminating the practice of supplementary feeding with sugar during the winter and when other plants like eucalyptus are not flowering.
  - At the end of its lifetime the coconut trunk can be converted into timber treated to be used for furniture as is the practice in countries like Thailand.

- Like the solution for livestock, there will be introduction of new technologies which may require an initial learning period from expatriate experts.
- In parallel to the coconut value stream with a potential for cattle which can become the core activities of fishermen, an innovative approach to sustainable fishing should be explored: a well-regulated lagoon fishing activity could be proposed to tourists as an experience to fish in the largest lagoon in the Indian Ocean. The revenues generated from this tourist activity could exceed the revenues from the fish which in itself will contribute to limit the total catch.

### **Global export centre of disease free queen bees**

- Around the world, bee colonies are collapsing from disease and suspected contamination from agro chemicals. This is raising serious concerns on global food production due to a large number of food crops and fruits which depend on bees for pollination. In the US and Europe farmers are paying beekeepers for pollination services to fertilize their crops and orchards.
- The ‘Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) with funding from AFD is carrying out in-depth research and development work to add value to the bee keeping sector which is now well established in Rodrigues. The concept of export of queen bees from Rodrigues was imagined in the 80’s by a Rodriguan beekeeper. (Mr Marc Edward who is still alive in Marechal). His idea was to introduce the Italian bee species to progressively replace the more aggressive and less productive African species. The recent DNA profiling by CIRAD has shown that this strategy has been largely successful.)
- The global propagation of diseases which are decimating bee colonies worldwide have opened a new opportunity to the concept of export of queen bees. The isolation of Rodrigues from the world with strict phyto-sanitary measures can maintain Rodrigues disease free. The logistics and marketing for export of queen bees should be explored. If validated, this could provide a significant boost to the bee keeping community and enhance the profile of this activity.
- The above country projects are fully compatible with the ongoing initiatives in agriculture and can actually reinforce them as follows:
  - Systematic capture of nutrients in livestock waste can provide affordable organic fertilizer in the quantities required to boost organic food crop production.
  - Introduction of coconut leaf meal can free up space previously used for grazing to be devoted to organic farming or agro forestry as per the suitability.
  - Increasing the population of bees across the island will be beneficial to fruits and crop production.

## 8.3 Manufacturing sector

### 8.3.1 Situation Analysis

- The manufacturing sector in Rodrigues has shown an increase in employment of 23% from 2011 to 2012 (1,515 employment) with small and medium enterprises being set up (from 10 in 2012 to 25 in 2013). The quality of transformed foods has improved with systematic use of glass jars, printing of expiry dates and producer contact details. Handicraft products has improved in design and quality, although the range of materials used is still limited.
- Expansion of the product base in manufacturing is seriously constrained by the logistics and cost of imported raw materials. An established sector in Rodrigues is furniture which caters for part of the local needs.

### 8.3.2 Proposed solutions

#### Setting up of a professional wood and furniture industry in Rodrigues

- There is currently only one saw mill in Rodrigues. There is an opportunity to boost the wood and furniture sectors based on the sustainable exploitation of local timber resources. There is currently a single operator (Percy Gontran in Montagne Chery) for transforming tree trunks into timber. The following species could contribute to the wood sector through optimal value addition:
  - The trunks of *Acacia nilotica*, a pest currently being eradicated could be converted to timber for making hard wood flooring (parquets) and small furniture
  - Mature *Tecoma* trees in planted forests could be harvested to be replaced by endemics
  - Mature *Casuarina* trees could be harvested for flooring to be replaced by endemics
  - Mature coconut trees could be harvested from existing tall plants exposed to cyclones and from future large scale plantations
  - All mature local hardwoods dying a natural death can be exploited
  - Mature *Eucalyptus* trees could be harvested for use in flooring / decking and structural uses. However, the Commission for Environment views Eucalyptus as a threat for the water resources. Furthermore, the Commission for Agriculture has identified one species locally know as the California variety which does not deplete water resources. Scientific research and evidence is required to evaluate and identify the strategy for Eucalyptus. There could be a compromise solution of the California variety grown on marginal land as a source of nectar and wood.
- In order to add optimum value to the above woods, kiln drying facilities are required to tailor the conditions to the optimum requirements of each species. The energy for kiln drying could be derived from 3 sources:
  - Waste heat from biogas plants which operate as Combined Heat and Power (CHP) plants
  - Solar powered heated systems with storage and a backup source
  - Biomass boilers operated with coconut shells
- A guaranteed, affordable and sustainable supply of quality assured and kiln dried timber constitutes the basis for a furniture industry in Rodrigues, which can absorb a large part of the idle labour after training and re-skilling by the 20 small operators in Rodrigues.

- There is an opportunity to attract retired master craftsmen from Mauritius to Rodrigues to transmit their skills to the young unemployed under an apprenticeship programme.
- Export of the manufactured furniture could benefit from the special marginal tariff applied to empty backhauls of containers from Rodrigues to Mauritius.
- The manufacturing sector strategy is therefore based on a high value added activity in 2 existing sectors, through sustainable exploitation of a renewable natural resource, using an unutilized resource of empty containers returning to Mauritius, with a potential to absorb a significant fraction of unemployed youth.
- The centralised livestock strategy will free up land which can be converted to agro forestry which will constitute the wood resources to be exploited in some 40 years' time. Coconut plantations will also contribute in this direction.

## **8.4 Tourism sector**

### **8.4.1 Situational analysis**

- Over the last two decades, tourism emerged as a growing sector of the economy. Some 52,777 travellers visited Rodrigues in 2001 and reached a peak of 63,649 in 2003. The number of visitors in 2012 was 52,043 with Mauritius and France/Réunion-Island occupying the main market.
- One of the main constraints for tourism is the seat capacity of Air Mauritius. In spite of assurances of Air Mauritius that it can respond to additional demand when needed, this has not been the case in many cases resulting in disruptions in group and family travel due to limited seats. Another constraint is availability of water which can limit the development of medium sized resort type hotels with swimming pools which are large consumers of water.
- Since the start of Cotton Bay Hotel in the early 90's, Rodrigues has a long tradition of attracting honeymooners. There is a new practice of 2<sup>nd</sup> and 3<sup>rd</sup> honeymoon which is an opportunity to be tapped. In view of the limited capacity in Rodrigues and limited seat capacity, the honeymoon segment represents an optimal tourism in terms of utilization of limited seat capacity because only the couple travel and stay for at least 1 week.
- In order to address the issue of democratization of the economy in the tourism sector, the concept of gites has been promoted. There is no formal data collection but it seems that there is a large proportion of eco-tourism visitors. Although there are no studies on the sustainable carrying capacity of Rodrigues, the optimal strategy for Rodrigues is to focus on the highest value added tourists.
- The ongoing efforts for compliance of hotels, and restaurants to the MS 165 eco-label should be fast tracked in Rodrigues. Mauritian hotels and restaurants will benefit from the framework set up and capacity building carried out for Energy Auditing and Energy Efficiency Building Code (EEBC). In the interest of sustainability, it is proposed that a

small group of Energy Auditors and EEBC Assessors be trained in Rodrigues to at least be able to carry out preliminary audits and eventually be certified like their Mauritian counterparts.

- During the working session with the tourism stakeholders, it was clear that hotels already enjoy a good occupancy and that any effort to increase capacity would not be productive if the airline seat capacity is not increased.
- One area which can substantially improve the carbon footprint of the Rodrigues tourism product is the logistics. There is a very high demand for cabins in the ships which serve the island. A dedicated passenger carrier with cabin and seated configuration would go a long way towards giving a boost to tourism and Rodrigues economy as a whole. This is a proximately applicable strategy and bankable business model, if the ship with the right characteristics of speed, comfort and access to the port can be identified on the global market.
- Taking into consideration the above, the tourism strategy should focus on attracting tourists with the highest value added and who also contribute to more sustainable and inclusive tourism. The concept of gites must be upgraded to capture higher value in line with the response from participation in international fairs where clients have expressed the demand for more luxury and comfort in gites.
- Access to finance by small holder gite operators is the main constraint for such upgrading of the gites. The Democratization Fund concept could be the way forward to give a push to small gite operators so that they can manage on their own after the buy-back period of about 5 years.

## 8.4.2 Proposed solutions

### **Promoting the emergence of the Honeymoon chalet concept**

- Rodrigues as a honeymoon destination is a proven concept which can be exploited further through some innovations:
  - The proposal is to develop a concept of chalets in prime areas on hill sides, with sea view on land allocated to entrepreneurs on the basis of the quality of the project and capacity to manage.
  - Some 30 prime sites can be allocated on a concession basis to develop 4 to 6 chalets type villas
  - The architecture and materials should be developed through a competition to achieve a consistent look, energy efficient green buildings using as much local materials as possible.
  - The push to be provided to local entrepreneurs will be in the form of development of their business plan which is already being supported through an RRA initiative.
  - The business plan should however lead to successful financial closure with funding from the proposed democratization fund and loans.

- The honeymoon chalets will also serve the higher end eco-tourism and gites markets, as part of the strategy to move towards higher value added tourism rather than focusing on larger number of arrivals.
- A national project of quality assured and well regulated chalets will enable the honeymoon segment to be democratized among Mauritians through the concept of ‘Liste de mariage’ whereby the honeymoon package can be funded through the collective gift from families and friends.

## **8.5 Cross-cutting issues**

### **Water**

- Water is a main constraint for growth in all economic sectors, particularly agriculture and tourism. The country projects proposed will address the issue of water scarcity through collection of waste from centralized livestock, coconut leaf meal feed to free up pasture land, and switching from overgrazed pastures to agro-forestry for conservation of moisture by the forests.

### **Fair trade**

- Another burning issue in Rodrigues is access to markets and supply chains and getting a fair share of the value produced. SMEDA has reported that supermarket chains in Rodrigues have difficulties to reference products from Rodrigues due to erratic supply. This has led to the practice of producers from Rodrigues travelling to Mauritius to sell their products in temporary stalls in shopping malls which is also perceived as erratic by end consumers.
- A more sustainable solution to fair trade and access to markets is the concept of ‘Maison de Rodrigues’ whereby a dedicated and permanent venue should be provided for all products and services in Rodrigues. This permanent venue could also include a Rodriguan food court and promotion of the Rodrigues tourism products.

### **Energy**

- Just like in Mauritius, the limited Solar PV capacity under Net Energy Metering has been subscribed by the highest paying consumers undermining CEB revenue base. The financial erosion for CEB/ Government from such self consumption is particularly damaging in Rodrigues due to the higher marginal cost of production which requires higher subsidies as there will never be larger engines, coal or Liquefied Natural Gas (LNG) power plants in Rodrigues.
- A dedicated scheme for SMEs and low/middle income households with a roof would reconcile the long term interests of reducing the subsidy load of CEB while securing a low cost/no-cost energy supply for vulnerable groups for over 25 years.



- There is a need for dedicated training of local resource persons in Energy Auditing, compliance with Energy Efficiency Building Code and Installation and Maintenance of Solar Photovoltaic Systems, design and operation of small scale (50 KW) biogas plant to produce electricity.

### **Eco-Labeling**

- In parallel with national eco-labelling initiatives like MS 165 in tourism and MauriGAP in food crops, the Label Rodrigues should be developed further for key products and their derivatives like honey, octopus, red beans, lemon, chillies, grass-fed beef and cheese, local pork, goat and sheep meat.
- In order to extend the market for the products, the ‘Maison de Rodrigues’ can give a significant boost to products with the label Rodrigues certification mark.

### **Eco innovation**

- The country projects proposed include an eco-innovation component which aim at transferring and adapting a proven technology to the scale and specificities of Rodrigues.

### **8.6 Conclusion and way forward for Rodrigues**

- Although Rodrigues has a number of weaknesses in terms of remoteness from Mauritius and foreign markets, a higher prevalence of poverty, unemployment and scarcity of water, it also has a number of strengths which are not fully exploited:
  - Its remoteness can be exploited in the niche areas identified, such as export of queen bees and honeymoon tourists.
  - The will of entrepreneurs to work to succeed when offered the opportunity and given a small push.
  - A matriarcal society, where women entrepreneurs can play a leading role.
  - The leadership and management capacity of the political class to rally the population to a common cause.
  - A fairly homogenous population without any dominant communities.

The scale of problems in Rodrigues are small enough to be treated as a laboratory of innovative concepts and large enough to be meaningful for scaling up in sub-Saharan Africa.

With its limited resources and fragile land and marine ecosystems, Rodrigues represents an ideal testing ground to validate the solutions to achieve resilience to climate change and sustainable solutions to current and future challenges of food and energy security.

The projects and policy recommendations aim at contributing to the objective of Rodrigues to achieve 100 % self-sufficiency in energy by 2030.

## 9.0 Country Implementation Plan

### 9.1 Country project Log frames

- The main recommendations and country projects identified in the Country Implementation Plan have been re-framed into 5 thematic areas for Mauritius and 4 thematic areas for Rodrigues as detailed in the log frames in Annex 3.
- The format adopted for the log frame is based on the following rationale:
  - The core outcomes expected in terms of behavioral changes and transformation of existing systems have been identified for each thematic area.
  - For monitoring purposes, the main outputs expected for each thematic area have been detailed in terms of the current or baseline situation and the desired outcome.
  - Where possible, for each outcome and output, the scheduling of implementation has been planned in terms of targets for 2016, 2017 and 2018.
  - The main risk factors and assumptions made have been documented for each outcome and output.
  - The host and support institutions for the action have been identified.
  - Budget for the action has been estimated in terms of costing for expertise required to provide consultancy and training and direct support to beneficiaries required to achieve bankable projects.
  - In the case of long term and large country projects, the cost of consultancy fees required for a mobilization of finance from impact investors and donors has been estimated.
  - The linkages to national policies, including the Agenda 2030 have been made to inscribe the action in the long term perspective.
- Thematic areas for Mauritius aim at focusing on the core issues which can lead to balanced triple bottom line outcomes. The ultimate outcomes of the thematic areas are listed below:
  - i. Stimulate a market for sustainable manure production and consumption through a comprehensive review of, and interventions on the legal framework for processing of animal waste, standards for animal manure, and manure subsidies.
  - ii. Professional livestock management systems in place and sustainable and profitable operations achieved through grouping of cattle, dairy and subsequently sheep and goat operations around biogas and manure composting and packing plants.
  - iii. Professionally-managed pack-houses set-up to add value to the agro produce from the agro-ecological zones, while also addressing issues of traceability, collective bio-certification, branding and meeting the requirements of distribution logistics.
  - iv. A dynamic SME sector focussed on higher value added and sustainable sectors supported by an SME service sector focussed on sustainability services to service local SMEs in Mauritius and Sub-Saharan Africa.
  - v. Develop a strong, inclusive and sustainable travel and tourism industry.
- The ultimate outcomes of the thematic areas for Rodrigues:
  - i. Professional livestock management systems in place and sustainable and profitable operations achieved through grouping of cattle, dairy and subsequently sheep and goat operations in feedlots and sheds.
  - ii. Develop large scale plantations of coconuts near the coast to provide a sustainable alternative to fishermen.

- iii. Develop an agro forestry on 1000 Ha of pastures currently being overgrazed by free roaming cattle.
- iv. Develop the Wood & Furniture and natural fibres sectors in Rodrigues based on local sustainable resources and craftsmanship
- v. Upgrade existing small accommodations towards a greener concept for 'Nature Lovers' through a sustainability audit and green refurbishment.
- vi. Develop a concept of chalets in prime areas on hill sides, with sea view, on land allocated to entrepreneurs on the basis of the quality of the project and capacity to manage.

The upgrading of 100 gites has been recommended by stakeholders as a priority project which should be implemented in the short term while the development of chalets can be considered in the medium to long terms.

## 9.2 Resource mobilisation and utilisation

- One of the challenges for switching to green is the mobilization of finance. Most of the conventional sources of funding are geared towards analysis of financial feasibility ratios and the risk profile of projects. Sustainable projects by definition also aim at environmental and social outcomes and are highly dependent on leadership, political will and good governance for effective implementation. A deep transition to green requires fundamental policy changes and a long term commitment for action. There is a need for research and development and modelling of triple bottom line benefits to mobilise financing from a wide range of special funds being set up for switching to green. The repayment of these funds are based on a combination of conventional project returns, and payments by public and private off takers for environmental and social benefits achieved by the project. Another critical dimension to be built into projects is the role of governance to ensure that the alternative business models and supply chains created are inclusive.

The limited resources available from development partners, donors and Government should be apportioned to 3 types of support to projects:

1. Projects with short to medium term outcomes and outputs which can materialize through consultancy or training like the conversion to green of 100 gites in Rodrigues. Priority should be given to local sources of expertise and where not available there should be built-in requirements for learning and transfer of expertise from foreign experts to locals to ensure sustainability.
2. Pilot projects to demonstrate and validate new concepts like farm based biogas plants in Mauritius and coconut leaves used as cattle feedstock in Rodrigues. In these cases, a grant element can contribute to offset the initial technology transfer costs and learning costs to make the pilot project bankable.
3. Country-wide long term projects which aim at transforming sectors like the livestock sector and to develop agro-forestry in Rodrigues. These projects require substantial amounts of long term funding which can only be mobilized through an in-depth modeling of triple bottom line benefits and by tapping the emerging sources of funding for sustainable projects.

**Table 13: Estimated budget in terms of support required for projects in Mauritius**

<b>Estimated budget in terms of support required for projects in Mauritius</b>		
Agro_Manure	330,000	USD
Agro_Livestock	1,575,000	USD
Agro- Food Crops	1,825,000	USD
Manufacturing	945,000	USD
Tourism	450,000	USD
	<b>5,125,000</b>	<b>USD</b>
	187,575,000	MUR

Source: Log frames in Annex 1

**Table 14: Estimated budget in terms of support required for projects in Rodrigues**

<b>Estimated budget in terms of support required for projects in Rodrigues</b>		
	USD	
Centralised Livestock	750,000	
Agro Forestry	780,000	
Manufacturing	900,000	
Tourism	360,000	
	<b>2,790,000</b>	USD
	<b>102,114,000</b>	MUR

Source: Log frames in Annex 1

### 9.3 Monitoring and evaluation of SAG country projects

- The monitoring and evaluation of projects must be carried out at 2 levels: at the level of implementation agencies and at country level to reach the SDGs and Vision 2030 objectives.

#### **I - Project implementation level:**

The project management methodology provides for tools to track progress and to implement corrective action to achieve targets within budget and scheduled time. The adoption of project management tools are recommended based on a detailed work breakdown structure to identify tasks and precedence relationships to track progress. The focus of project monitoring should be on outcomes rather than inputs.

#### **II - Linkages with SDGs and Vision 2030**

The other level of monitoring of SAG country projects is towards the achievement of the SDGs and Vision 2030 objectives. There is a need to develop a Mauritius Action Plan to materialize the objectives of Vision 2030 and to develop linkages between this Mauritius Action Plan, Sustainable Development Goals, and the Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway.

- One proposed approach is to customize the Vulnerability Resilience Country Profile (VRCP) Framework as a planning and monitoring tool for SWITCH Africa Green country projects and other initiatives as part of the Mauritius Action Plan.

- The SWITCH Africa Green country projects would contribute to the strengthening of the green economy and green jobs pillar of the Mauritius action plan.

## **Annex 1 Diagnostic Country Project Log Frames**

























## **Annex 2: Summary of outcomes of Validation workshop in Rodrigues 1<sup>st</sup> July 2016**

The workshop was attended by over 30 participants. After a presentation of the country projects by the national consultant, 4 working groups were constituted to analyse and discuss the projects, make changes and provide the main inputs for the log frame. There was active participation and new ideas have emerged from within groups and across sectors:

- Agriculture-Livestock
- Manufacturing sector
- Tourism
- Managed Forestry

The main contributions from each working group were as follows:

### 1. Agriculture-Livestock

The main concepts of the centralized livestock proposal were reviewed and discussed by the group. There are some parts of Rodrigues where cattle farmers have a larger number of heads of cattle which could be the site for the first centralization pilot project. This approach would respect the individualistic nature of entrepreneurs in Rodrigues.

It was estimated that 50 % of the land currently devoted to grazing could be freed for Agro-Forestry, with the balance being allocated to livestock farmers for intense cultivation of Elephant grass, Acacia and other animal fodder crops to feed the cattle using the liquid component of fertilizer as an input. There was a consensus that the revenues from sales of electricity and quality assured manure would contribute to promote the switch from free grazing to cut and carry fodder which has cost implications. At the core of the project is the negotiations with CEB for a feed-in tariff to achieve a feasible and bankable project. As is the case in Mauritius where subsidy is provided on compost from Municipal solid waste, a small subsidy component on the manure produced could be considered during the initial stages of the project to enable meeting financial charges and other upfront technology transfer and training costs.

One of the success factors of such a sophisticated approach to integrated farming is the professional operation and management of the biogas cum manure plant by local technicians and engineers who must be fully trained to become autonomous during the project implementation and start-up phase.

### 2. Agro-Forestry

Members were advised that there is growing global awareness of the potential of agro forestry in meeting the objectives of SDG 15 which is to preserve land resources, contribute to carbon sequestration to meet a fraction of the required abatement of GHG to remain below 2 degrees global warming target and to restore soil biodiversity.

4 project components were identified:

1. Convert half of the grazing lands, that is 1000 Ha from overgrazed pasture to managed forests in selected areas where it is not practical or economical to grow fodder for cattle.
2. It was estimated that 150 Ha of coconut plantations would enable 150 000 coconut trees to be planted which would enable 300 fishers that is half of the total of 600 to earn an alternative living from a plantation of 500 coconut trees each over half Ha.

3. Convert 1000 Ha out of the 3000 Ha of forest land to endemic forests by eliminating the alien species and planting a combination of fast growing and slower growing endemics. This will also contribute to restore the local endemic bird fauna populations which are still endangered.
4. Convert the balance of 2000 Ha of forests into sustainably managed forests for Wood, Honey, Eco-Tourisms and wild fruits.

Due to the global urgency for meeting GHG abatement targets, the United Nations Convention to Combat Deforestation (UNCCD) is launching a Land Degradation Neutrality (LDN) Fund in the last quarter of 2016, which is a potential source of funding, particularly for component 1 above. It was agreed that due to the very long term returns of reforestation and agro-forestry projects, a component of grant funding is essential.

### 3. Manufacturing sector

The concept of sustainable exploitation of wood resources was developed and it was agreed that the wood and furniture sector has the potential to absorb a large part of unemployed youth. This would be achieved by securing the part time workers to full time and the creation of new enterprises by unemployed under an apprenticeship scheme. After the implementation of the projects identified, there will be 4000 Ha of managed forests in Rodrigues out of a total land mass of 10 000 Ha.

It was estimated that 4 professional sawmills would be required to process the sustainable wood resources when the 4000 Ha of managed forests have been established. Invest Rodrigues would work on the scheme to attract investors to set up the professional sawmills and kiln drying facilities on a build, operate, train and transfer basis.

In order to give a boost to the handicraft sector, it was agreed that the range of materials must be enhanced to include local hardwoods and fibres from local plants.

### 4. Tourism

While it was appreciated that the concept of chalets is valid for the medium term to tap higher value niche eco-tourism markets, the immediate priority to be addressed is the plight of the 100 gites owners who have invested considerably but are mostly operating at around 40 % occupancy. This vulnerable status does not enable them to upgrade their premises to offer better services to improve their occupancy and profitability.

The proposition is to develop a scheme which would enable the 100 gites to refurbish their building and retrofit it with equipment to achieve a green building standard using the Energy Efficiency Building Code (EEBC) as a standard. The national EEBC could be customized for Rodrigues climatic conditions, water scarcity and to the specific requirements of gites. A renewable energy component could be added to enable the gites to offset their energy consumption. This initiative would lower the operations costs of gites while providing better thermal comfort and water efficiency and enhance the green image of the gites segment within the positioning of Rodrigues as a green island.

In order to maximize the impact and net benefits, the proposed approach is to train a group of local qualified engineers and technicians as Energy Auditors and EEBC assessors to enable them to audit and re-design the gites to comply to the Rodrigues Gites EEBC.

It is also proposed to offer training to local trades person in the techniques and measures required to achieve compliance with EEBC. It is expected that this group of trained local experts and small contractors would offer their services to the other commercial sectors and the large residential sector thus ensuring their sustainability after the project.

## **The strategic role of Maison de Rodrigues in Mauritius in the sustainability strategy of Rodrigues**

The main issue cutting across all primary, secondary and tertiary sectors in Rodrigues is fair trade. The link of Rodrigues to the external world is currently limited to an inadequate air access to Mauritius and sea freight limited in frequency. This constitutes a bottle neck for access to markets for all sectors and creates an asymmetry of information and relative power in buyer-seller relationships in favor of a few intermediaries.

A strategic move to give a significant boost to all sectors of the economy in Rodrigues is the Maison de Rodrigues as a single window for promotion of Rodrigues. All the ongoing development initiatives in Rodrigues and the country projects under Switch Africa Green will benefit from the direct access to Mauritian and tourist consumers at the Maison de Rodrigues.

This can become a full day tourist venue to enhance the content of the Mauritian destination while also constituting a cultural hotspot for promoting Rodrigues cuisine, music, handicraft, specialty foods, creole furniture, organic produce and tourism products.

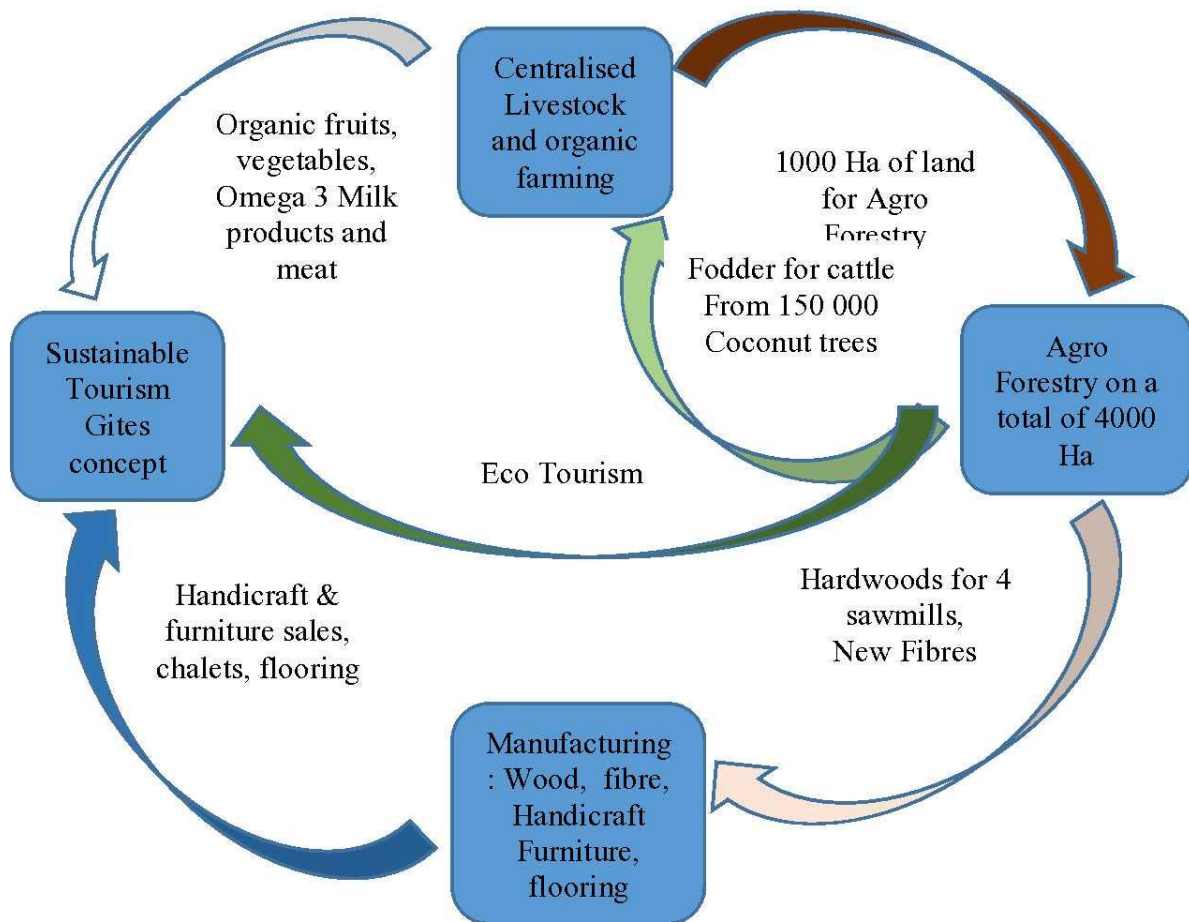
### **Inter connected nature of projects and confidence in the initiative**

The schematic in the next page shows that the 4 core projects are closely interlinked and should be planned and implemented concurrently. Any missing project or component of a project not implemented will affect other sectors.

One of the main feedbacks received during the validation workshop was that stakeholders in Rodrigues have been invited in numerous past workshops which have not resulted in concrete action and projects. The following arguments were conveyed to participants to reinforce their confidence in the country projects proposed:

- There is a renewed interest at the level of the Republic of Mauritius to give a boost to the SME sector as a means for sustainable job creation and inclusive growth. A 10-year SME Masterplan is under preparation which should include a component for Rodrigues to support the SME based projects being proposed for Rodrigues.
- The COP 21 Summit and Sustainable Development Goals (SDGs) launched in Sept 2015 have created a renewed focus on sustainable projects and highlighted the need for new financing models for sustainable projects to achieve SDGs.
- Central Government has a declared policy for the sustainable development of Rodrigues. Vision 2030 includes a section dedicated to Rodrigues which will capture the short, medium and long term actions which will also be aligned to the SDGs.

**Figure 2: Cross sectoral linkages and benefits based on an integrated package of projects.**



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## **Annex 4: Key institutions consulted**

### **Agriculture:**

- Ministry of Agriculture and Food Security
- FAREI
- Mauritius Chamber of Agriculture

### **Manufacturing:**

- Ministry of Business and cooperatives
- Ministry of Industry and Commerce
- SMEDA
- Mybiz

### **Tourism:**

- Ministry of Tourism
- Tourism Authority
- AHRIM
- Association Hotel de charme.

### **Others**

- Ministry of Finance and Economic Developement
- Strategic Policy and Planning Department (SPPD)
- Department Head Commission of Agriculture,
- Commissioner, Department Head Commission for Enviromment and Tourism Rodrigues
- Officers Tourism promotion in Rodrigues
- Forestry department Rodrigues
- SMEDA in Rodrigues
- Invest Rodrigues

## Annex 5: Terms of reference



### DETAILED TERMS OF REFERENCE

for

### Individual Consultant for the SWITCH Africa Green Programme

#### 1. Project Summary Table

PROJECT TITLE	Policy Support for SWITCH Africa Green Programme
COUNTRY	Mauritius
REGION	Africa
FOCAL AREAS	i. Sustainable Consumption and Production ii. Green Economy Policy
DUTY STATION	Mauritius
TITLE	One Consultant for the SWITCH Africa Green Programme
EXPECTED DURATION OF ASSIGNMENT	45 working days over four months

#### 2. Background

##### 2.1 Sustainable Consumption and Production

The outcomes of the 2012 United Nations Conference on Sustainable Development and the dedication of one of the Sustainable Development Goals (SDG) to promote Sustainable Consumption and Production (SCP) are clear indications that shifting to sustainable consumption and production patterns is central to achieving sustainable development. Mauritius has shown its commitment to green its economy through SCP practices by developing its own national programme on SCP in 2008. The main objective of this national framework is to mainstream sustainability principles in priority areas through resource efficiency and adoption of sustainable practices, education and sustainable lifestyles.

With a view to enhance integration of SCP at the regional level, the European Union developed the SWITCH Africa Green Programme with the collaboration of UNEP, UNOPS and UNDP.

This programme aims at supporting African countries to achieve sustainable development by promoting development of green businesses and eco-entrepreneurship, based on the adoption of SCP practices. This will be achieved through support to the private sector, more specifically Small and Medium Enterprises (SMEs), for them to be better equipped to seize opportunities for green business development. The SWITCH Africa Green programme will also assist pilot countries to develop enabling conditions in the form of clear policies, more appropriate regulatory frameworks, economic incentives and market-based instruments, to enhance their capacities to transition to a green economy. Identified priority sectors for the Republic of Mauritius are the Manufacturing, Tourism and Agricultural sectors, and Energy as a crosscutting theme.

Implementation of the SWITCH Africa Green Programme comprises 3 components: Policy support to review existing policies of key sectors and identify opportunities for promoting SCP and green economy; Green Business Development to integrate resource efficiency and SCP practices in businesses; and Networking Facility to enable dissemination and replication of good practices.

Transitioning to more sustainable pathways entails a reconfiguration of the structure for production, distribution and consumption of goods and services. Hence the need for this Consultancy to review existing policies so as to develop more appropriate regulatory frameworks, economic incentives, and innovative business ventures which will promote a green and inclusive business environment in the Republic of Mauritius.

### **3. Purpose, Objectives and Scope**

#### **Purpose**

The purpose of the project is to prepare an implementation framework for the SWITCH Africa Green Programme in the Republic of Mauritius, based on an assessment of the policy and business environment of the country.

#### **Objective**

The objectives of this consultancy are as follows:

- a. To support the Ministry of Environment, Sustainable Development, Disaster and Beach Management to prepare an implementation framework for implementing the SWITCH Africa Green Programme in the Republic of Mauritius.
- b. To develop policies and strategies to better integrate sustainability practices in the identified sectors for the Republic of Mauritius.

#### **Scope of Services**

- a. Carry out a policy review/ scoping exercise of existing policies, regulations, standards and instruments, and mapping of gaps on SCP and Green Economy. The exercise should also include policies related to eco-entrepreneurship and eco-innovation focusing on priority

sectors identified for the SWITCH Africa Green Programme. The scoping exercise includes consultation and working sessions with established technical sub-committees in key sectors for the SWITCH Africa Green Programme.

- b. Assess the business environment of Mauritius and identify opportunities for green business development and uptake of SCP practices.
- c. Prepare a Country Inception Report and a Country Implementation Plan.
- d. Propose a project monitoring and evaluation framework based on SCP indicators.

#### **4. Specific tasks and responsibilities**

- i. Detailed description of focal areas/ activities through consultation at national level and with technical sub-committees as well as key stakeholders in the public and the private sectors and civil society that should be engaged;
- ii. Inventory of existing policies, regulations, standards and instruments and mapping of gaps in knowledge and policy frameworks, including reviews of SCP and green economy policies, particularly those focusing on eco-entrepreneurship and eco-innovation on identified priority sectors.
- iii. Review or initiate Green Economy scoping studies.
- iv. Assessment of the business environment in focussed sectors and identification of capacity building needs, more specifically for the key sectors under the SWITCH Africa Green Programme.
- v. Review of current sources of private investment, both domestic and foreign, that are shaping the national economy.
- vi. Review of green investment opportunities in the selected sectors to be outlined in terms of financial investment required, resulting increases in productivity, increase in resource efficiency and reductions in pollution, with some indications of returns on investment and payback times, where sufficient data exist.
- vii. Develop key policies, economic and fiscal instruments and capacity building measures necessary to enable the redirection of investment, the re-orientation of markets and the reshaping of business strategies and operation towards sustainability.
- viii. Define the criteria and key elements of country projects, based on the above recommendations, that will explore these proposed measures, their practicality and requirements for effective implementation.
- ix. Identify areas for capacity building for implementing SCP and Green Economy policies.
- x. Participate and make presentations during stakeholder consultative meetings and validation workshop for finalising the Country Implementation Report.
- xi. Prepare and finalise the Country Implementation and Inception Reports.

#### **5. Deliverables**

The Consultant will prepare and submit to the Ministry of Environment, Sustainable Development, Disaster and Beach Management the following reports and outputs:

- a. An Inception (Work) Plan, inclusive of a Programme of Work.
- b. A first draft of the Country Inception Report comprising of the Scoping Exercise and Policy Review as well as an assessment of the business environment.
- c. A first draft Country Implementation Report, detailing the management structure for SWITCH Africa Green Programme at national level, the national delivery plan and log-frame, and the schedule of activities.
- d. Organise and act as Resource Person for the Consultative and Validation Workshops.
- e. Final versions of the Country Inception Report and Country Implementation Reports, including a project monitoring and evaluation framework based on SCP indicators.

The Consultant shall submit the reports both in soft and hard copies. Soft copies should be in a format acceptable to the Ministry of Environment, Sustainable Development, Disaster, and Beach Management.

The **Country Inception Report** should include the following (indicative table of contents):

1. Title
2. Table of contents
3. Acronyms and abbreviations
4. Executive summary: A part from a comprehensive consultancy report will constitute the major output of the consultancy; the Consultant is requested to produce a clear and well written two to three page summary bringing out the main findings and recommendations from the report. This will guide the presentation for stakeholders workshop to validate the findings of the report;
5. Introduction and background
6. Scope of the assignment
7. SCP Practices for Green Growth
8. Methodology and Data acquired.
9. Policy Review – Policies and regulations promoting Green Economy
10. Assessment of the business environment – Investment Climate and Tax Incentive Structure
11. Conclusion and Way Forward
12. Annexes

The main report should not be more than 40 pages, excluding annexes.

The **Country Implementation Report** should include the following (indicative table of contents):

1. Title
2. Table of contents
3. Acronyms and abbreviations
4. Executive summary: A part from a comprehensive consultancy report will constitute the major output of the consultancy; the Consultant is requested to produce a clear and well written two to three page summary bringing out the main findings and recommendations from the report. This will guide the presentation for stakeholders workshop to validate the findings of the report;
5. Introduction and background
6. Scope of the assignment
7. Situation Review (Policy Gaps, Sector specific analysis, Institutional Issues and Capacity Building Needs of key sectors)
8. The SWITCH Africa Green Programme (Project objectives, components and approach; Country Strategy; sector strategic approach; and success indicators)
9. National delivery plan (Programme Implementation Management and organisation and Programme Monitoring, Review and Reporting)
10. Log-frame and the schedule of activities
11. Annexes

The main report should not be more than 50 pages, excluding annexes.

## **6. Competencies**

### **Corporate Competencies:**

- Demonstrates integrity by modelling the UNs values and ethical standards;
- Advocates and promotes the vision, mission, and strategic goals of UN;
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability;
- Treats all people fairly without favouritism.

### **Functional Competencies for the consultant**

- Excellent writing and good analyzing aptitude. Proven experience in writing of analytical reports.
- Ability to work independently and respond to feedback in a timely and professional manner.
- Good organizational skills, attention to detail, and ability to work in multi-cultural environment.

- Excellent understanding and knowledge of SCP practices
- Excellent writing and good analyzing aptitude. Proven experience in writing of analytical reports.
- Ability to work independently and respond to feedback in a timely and professional manner.
- Good organizational skills, attention to detail, and ability to work in multi-cultural environment

## **7. Required qualifications of the consultant**

### **Education**

The consultant should have an advanced degree in policy or environmental studies or natural science or engineering, or management.

### **Experience**

1. The task requires over 10 years working experience, with proven abilities to carry out research, analysis and assessment with recommendations and identifying synergies.
2. The consultant needs substantive knowledge and experience on green economy, policy analysis, and SCP, preferably in the sectors of manufacturing, agriculture, tourism and energy. The task also requires specific skills on undertaking analysis and assessment with combined considerations of economic, social and environmental issues. Working experience with SMEs and different national stakeholders is an added advantage.
3. Knowledge of UN working procedures or previous contracts with UN systems is an added advantage.
4. He/she should demonstrate proven abilities for report writing; good organisational and communication skills; team work
5. Candidate must be IT literate.
6. Previous work experience in Mauritius will be an asset.

### **Language**

Excellent written and spoken English is required. Knowledge of French will be an added advantage.

## **8. Duration of contract**



This assignment is for a duration of 45 working days over four months, starting from end of January 2016 to no later than end of May 2016, including consultations with stakeholders and presentation of findings.

## **9. Scope of Price Proposal and Schedule of Payments**

### **Price Proposal**

- The financial offer should be quoted as a lump sum amount, ‘all-inclusive ‘. The term “All inclusive” implies that all costs (professional fees, travel costs, living allowances, communications, consumables, etc.) that could possibly be incurred by the Contractor are already factored into the final amounts submitted in the proposal
- The contract price is fixed regardless of changes in the cost components. Payments will be effected based on deliverables

### **Payment Schedule**

- 20% - Upon submission and approval of an Inception (work) Plan inclusive of a programme of work (within 1 week of start of assignment)
- 20%- Upon submission and approval of a first draft of the Country Inception Report, comprising the outcome of scoping exercise, analytical works and policy review (within 4 weeks of start of the assignment)
- 30% - Upon submission and approval of a first draft of the Country Implementation Plan (within 6 weeks of start of assignment).
- 30% - Upon approval of Final version of the Country Inception Report and Country Implementation Report (within 9 weeks of start of the assignment)

## **10. Proposed Work Plan and Indicative Timeline**

- It is planned that the consultancy will start end of January 2016, and shall expire on the satisfactory completion of the services described above by the end May 2016.
- The following schedule of activities is only illustrative, and a final timeline will need to be refined and presented by the consultant to the Ministry of Environment, Sustainable Development, and Beach and Disaster Management:

INDICATIVE TIMELINE	ACTIVITY
Week 1 of assignment	Contract Signature and inception (work) plan inclusive of a programme of work
Week 3 of assignment	Consultative workshop
Within 4 weeks of start of the assignment	First draft of the Country Inception Report, comprising the outcome of scoping exercise, analytical works and policy review
Within 6 weeks of start of assignment	First draft of the Country Implementation Plan.
Weeks 7 and 8 of assignment	Validation Workshop
Within 9 weeks of start of the assignment	Country Inception Report and Country Implementation Report

## Reporting Line

The Consultant shall report to the Director of Environment, Ministry of Environment, Sustainable Development, Disaster, and Beach Management, throughout the duration of the project and shall maintain constant liaison with the Ministry to discuss on matters pertaining to progress of works as well as for eventual claims for payment.

The National Coordinator for the SWITCH Africa Green Programme shall provide support to the National Consultant by preparing base line documents on Green Economy and carrying out Scoping and Mapping Exercises for the identified key sectors.

A Liaison Officer shall be nominated from the Ministry of Environment, Sustainable Development, Disaster, and Beach Management.

During the part of the assignment that is to be spent in Mauritius the consultant will be based at the Ministry of Environment, Sustainable Development, and Disaster and Beach Management.

## Recommended Presentation of Offer

Applicants are requested to submit their applications [to jobs.mu@undp.org](mailto:jobs.mu@undp.org).

As per UNDP requirements, individual consultants are also requested to submit the following documents:

**1. Duly accomplished Letter of Confirmation of Interest and Availability** using the template provided by UNDP;

**Personal CV and P11 (both)**, indicating all past experience from similar projects, as well as the contact details (email and telephone number) of the Candidate and at least three (3) professional references. **Candidates not submitting P11 will not be considered.**

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**2. Brief description** of why the individual considers him/herself as the most suitable for the assignment, and a methodology, **if applicable**, on how they will approach and complete the assignment;

**3. Financial Proposal** that indicates the all-inclusive fixed total contract price, supported by a breakdown of costs, as per template provided. If an Offeror is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the Offeror must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP.

**Criteria for selection of best offer:**

The award of the contract will be made to the Individual Consultant whose offer has been evaluated using

the “Combined Scoring Method” and determined as:

- Responsive/compliant/acceptable;
- Having received the highest score out of a pre-determined set of weighted technical and financial
- criteria specified below (Technical Criteria weight (0.7), Financial Criteria weight (0.3).
- Only candidates obtaining a minimum of 70% in the technical evaluation would be considered for the Financial Evaluation.
- Mauritian nationals are strongly encouraged to apply.

<b>Educational Qualifications</b>	<b>General Experience</b>	<b>Knowledge and experience</b>	<b>Proven analytical Experience,</b>	<b>Proven ability</b> to development well researched analytical reports	<b>Language</b>	<b>Total</b>
An advanced degree in policy, or environmental studies, natural science, engineering, or management	10 years working experience, including with SME's	on green economy, policy analysis, and SCP, preferably in the sectors of manufacturing, agriculture, tourism, or energy	including research, analysis and assessment with the ability to development recommendations and identifying synergies.		Fluency in English is required.	
10 MARKS	10 MARKS	15 MARKS	15 MARKS	15 MARKS	5 MARKS	70 MARKS

**DEADLINE FOR APPLICATION IS 24 JANUARY 2016.**

**This TOR is approved by**