International Labour Organization

Assessing current and potential Green Jobs: the case of Mauritius

Policy Brief

Introduction

Green Jobs in Mauritius stands at around 6.3% of total employment (35,160 jobs out of a total of 558,100). This policy brief provides a summary of the assessment of existing green jobs in Mauritius undertaken in 2010. It concludes with providing a short term projection of a green growth scenario as opposed to a conventional one. The assessment originated from a request by the Government of Mauritius and was conducted by the ILO and a research team in Mauritius in 2011/2012. Its aim is to inform the Ministry of Labour as a contribution to shaping the Maurice Ile Durable (MID) strategy launched in 2008, which intends to make Mauritius a model country of sustainable development.

Methodology[1]

For the purpose of this study, **three methods** to measure Green Jobs are considered:

(i) the **process-based method** and

(ii) the **output-based method** captures employment in 'market-valued' products and processes, while

(iii) the **natural resource conservation method** involves jobs providing public goods (no market value).

The process-based method defines as Green those jobs that are in enterprises which are among the 10% most energy and water efficient. This methodology has been used notably for manufacturing and tourism.

The output-based method refers to the characteristics and use of the final product or service having a beneficial environmental purpose. An example is a solar powered water heater, or geyser. This method has been utilized for the agriculture and renewable energy sector and follows the European industrial classification of environmental goods and services.

The natural resource conservation method seeks to identify sectors and employment which have a direct link with protecting or enhancing environmental quality. These activities typically provide public goods where no private markets exist. Green jobs in these sectors are found in national parks and marine conservation activities.

Additional research has been done on the level of decent work of employment, through certification like Fair Trade in Agriculture or the formality (official contracts) of employment. In the recycling industry, for example, only jobs in formal enterprises have been counted as Green Jobs.

Findings

As of 2010, Green Jobs for Mauritius stands at around 35,000 which is 6.3% of total employment estimated at 558,100. Most Green Jobs are found in electricity generation, with 23% of jobs in supplying bagasse from sugar cane to electricity plants. In Agriculture a 12% share of employment can be considered green as well as decent. In textiles only around 5% of employment was found to be green. Some textile companies have been greening their processes with for example solar water heating systems, grey water use, recycling and natural air cooling, thereby reducing energy by up to 30%. Similar technologies have been introduced into the hotel sector where about 3% of the jobs are found in highly energy- and water-efficient tourist resorts.

[1] ILO (2011) Assessing Green Jobs Potential in Developing Countries: A Practitioner's Guide (http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_153458/lang--en/index.htm)

Potential for green jobs

It is important to emphasize that each sector is linked in one way or the other with other sectors in the economy. Thus, a strategy to enhance production in a particular sector (by investment and/or raising demand) will also lead to a rise in employment and production in other sectors through backward and forward linkages along the supply chain. To assess these indirect linkages the output and employment multiplier has been calculated. The output multiplier shows the resulting rise in demand and output in other sectors. These other sectors produce inputs which are needed in the production process of the sector which increase final output. Similarly, employment multipliers show the generation of employment in the sector itself as well as the other sectors which supply input to the final output sector. In order to calculate the output and employment multiplier, the *input-output* method is used. The *input-output* table 2009 from the Statistic Office, Mauritius, has been disaggregated into sub-sectors such as green agriculture, sustainable fishing, green textile, recycling, green hotel, sustainable transport, renewable energy among others. Thereby the production linkages for these sectors and sub-sectors have been adjusted.

Having disaggregated sectors into conventional and green, a hypothetical 'what if' scenario has been applied. This is done by assuming a one million Rupee increase in final demand. Such a scenario allowed comparing the output and employment effect in the conventional sub-sector with the green sub-sector.

Table 1: One million Rupee increase in final demand and its effects on output, direct and indirect jobs on selected sectors

	Contribution to GDP as % of total	Employment per sector as % of total and % of green and conventional sector shares		Output multi-plier	Direct jobs created by an 1 million Rupee increase in final demand	Indirect jobs created by an 1 million Rupee increase in final demand	Total jobs created by an increase of 1 million Rupee increase in final demand
Agriculture (sugar)	**4%**	**8%**					
Conventional			88%	1.21	2.28	0.29	2.57
Green			12%	1.30	2.28	0.41	**2.69**
Manufacturing (textile)	**18%**	**21%**					
Conventional			95%	1.58	0.7	0.8	1.5
Green			5%	1.54	1.7	0.8	**2,5**
Services (hotel)	**7%**	**7%**					
Conventional			97%	1.37	0.67	0.55	1.23
Green			3%	1.37	1.49	0.55	**2.05**
Energy	**2%**	**1%**					
Fossil fuel			77%	1.6	0.2	0.6	0.8
Renewable			23%	2.5	0.2	1.2	**1.4**
Other sectors	**69%**	**63%**					
Total	**100%**	**100%**	**6.3%**				

Agriculture: 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 per cent (and +7 per cent for the output). This is since green agriculture relies relative more on inputs which are produced locally such as organic fertilizers. This eventually implies the use of more transportation, packaging and other processes in the production of these inputs. Thus, when planters use inputs from the domestic economy, they create relatively more demand and employment in other sectors as well.

Green manufacturing and textile: The green manufacturing sector stands out notably because of a higher direct employment effect (1.7 vs. 0.7). The higher employment effect translates into employment gains of +67% in comparison to the conventional sector. Given that renewable energy systems such as solar water heaters, recycling measures and grey water use are more labor intensive than operating conventional factories the higher employment effect is intuitive.

Tourism: Hotels that are resource efficient use solar water heater systems, recycling facilities, energy saving equipment and continuous training of staff. These activities within the green hotel sector seem to be responsible for the – in comparison to the conventional hotel sector - higher direct employment effect (1.5 vs. 0.7). Employment gains of over 60% can be expected.

Renewable Energy: Renewable energy creates relative more output (2.5) and employment (1.4) than conventional fossil based electricity generation (output 1.6 and employment 0.8). This translates into employment and output gains of round +75%. The main reason is that the generation of renewable energy uses inputs from the domestic economy, notably bagasse, which in turn generate employment and output in the supply chain. Fossil fuels are imported, have a very short supply chain and hence entail little number of jobs. Conversely, the supply and by-firing of bagasse entails jobs in haulage, feeding and operation of the electricity generating plant.

Comparing a green growth scenario with a conventional scenario

For the purpose of informing policy choices a simple comparison can be made between a green and a conventional growth scenario, using the calculated output and employment multipliers. Assuming a conservative 2.5% growth in total industrial output per year – which is roughly around Rs. 10 billion – the model allows for a short term simulation between scenarios.

The four main sectors – agriculture (sugar), manufacturing (textile), tourism (hotel) and energy (renewable versus fossil fuel) – have been selected for simulation. An increase in industrial output in those sectors by a combined total of 10 billion Rs. would lead to an increase of 21,600 jobs in the green scenario as opposed to 15, 250 jobs when following a conventional growth path.

The difference stands out for the energy sector. Due to the high multipliers the output effects are estimated to be also higher in the green scenario. Assuming a 2.5% growth in industrial output of the total energy sector (or roughly 280 million Rs.), a total output growth - all industries combined - of 700 million Rs. can be expected in a green scenario (i.e. when outputs growth is assumed in the renewable sub-sector). In comparison, Increasing output in the fossil fuel sub-sector by the same amount would only lead to an overall output growth of around 450 million Rs.

In terms of employment, the increase in jobs in the renewable scenario would be nearly double compared to the effect of simulated output growth in the fossil fuel sector.

The differences between the green and the conventional growth scenario - as illustrated in the renewable energy sector - are due to the higher integration of green industries and notably renewable energy based activities through linkages into the value chains of the Mauritian economy. Conversely, fossil fuels are imported and have much weaker linkages into the domestic economy, therefore generating less additional employment and value added.

This simple model indicates that redirecting growth towards a greener scenario (through investment and increased demand) can result in higher output and more jobs.

The methodology described in this policy brief is currently also applied other countries, like Mexico and Kenya.