

African region awareness creation workshop to maximize the positive and minimize the negative impacts of implementation of climate change response measures

UNFCCC Secretariat and ILO
South Africa, Cape Town

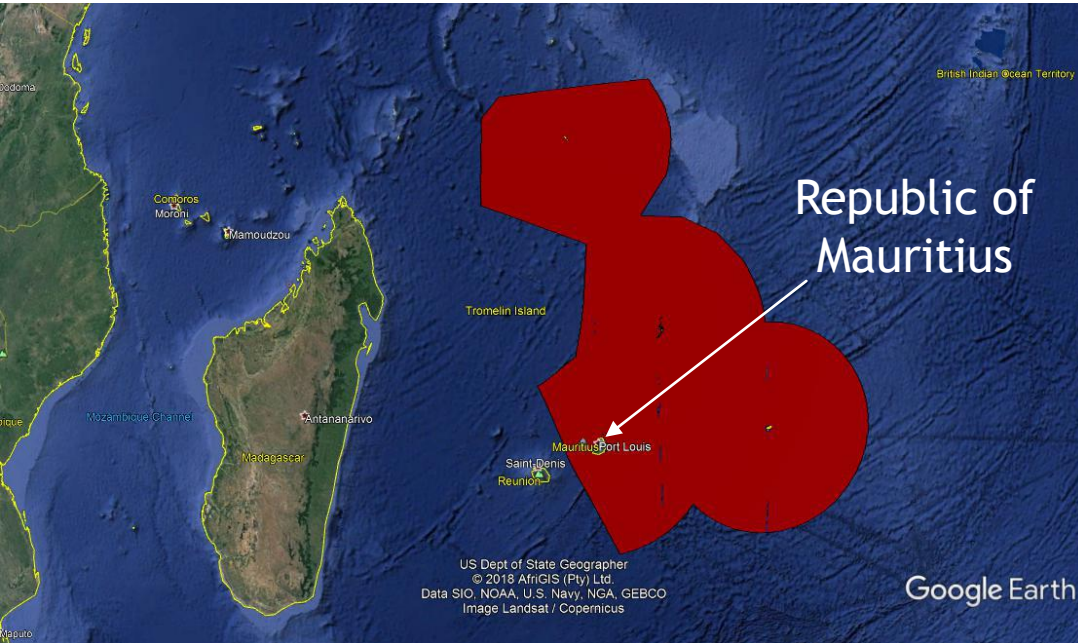
Economic diversification for a green and climate compatible development: The Case of Mauritius

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Key issues

- ▶ Modelling and quantifying impacts of response measures to climate change

The Republic of Mauritius



Main island, Mauritius, is an area of 1,860 square km

The Exclusive Economic Zone (“EEZ”) of the Republic of Mauritius extends over an area of about 2.3 million Km² (including approx. 400,000 Km² jointly managed with the Seychelles)

This makes Mauritius the 20th country in the world with the largest EEZ.

Social indicators	2016
Population (mid-year)	1,263,473
Life expectancy at birth (years)	
- Male	71.4
- Female	78
Crude birth rate (per 1000 population)	10.4
Crude death rate (per 1000 population)	8.1

Economic indicators	2012	2013	2014	2015	2016
Real annual growth rate of GDP (%) ¹	3.5	3.4	3.7	3.6	3.8
Real annual growth rate of GDFCF (%) ¹	0.8	3.3	6.0	5.4	3.7
Rate of inflation (%)	3.9	3.5	3.2	1.3	1.0
Per capita GDP at current market prices (US dollar)	8201	8694	9143	9546	10106
Per capital GDP growth constant 2010 price	3.21	3.13	3.56	3.33	3.63

Industry groups	2016
Agriculture, forestry and fishing	3.19
Sugarcane	0.76
Other	2.42
Mining and quarrying	0.21
Manufacturing	12.40
Sugar	0.19
Food excl. Sugar	4.38
Textiles	3.65
Other	4.18
Electricity, gas, steam and air conditioning supply	1.94
Water supply, sewerage, waste management and remediation activities	0.34
Construction	3.69
Wholesale & retail trade; repair of motor vehicles and motorcycles	10.56
Transportation and storage	5.60
Accommodation and food service activities	6.15
Information and communication	3.77
Financial and insurance activities	10.72
Real estate activities	5.25
Professional, scientific and technical activities	4.12
Administrative and support service activities	2.56
Public administration and defence; compulsory social security	5.72
Education	4.36
Human health and social work activities	3.80
Arts, entertainment and recreation	3.03
Other service activities	1.38
Gross Value Added (GVA) at current basic prices	88.76
Taxes on products (net of subsidies)	11.24
Gross Domestic Product (GDP) at current market prices	100.00

Environment and climate expenditures

- ▶ Environment and climate expenditures represent about 7 to 7.5% of total government expenditure during the period 2011-2014 and about 2% of GDP during this period.

(Source: Tracking Public Sector Environment Expenditure (TPSEE), Government of Mauritius)

The Government's greening programme

- ▶ Government Programme (2015-2019) 's aims is to 'transform Mauritius into a truly forward looking, environmentally sustainable, economically vibrant and innovative country with modern infrastructure, global connectivity, high skills and technology'
- ▶ The 2015-2016 Budget
 - ▶ tax incentives for the promotion of Green and Sustainable Development include an accelerated Income Tax Depreciation Provision for Green Investment.
 - ▶ 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.
 - ▶ An Exceptional accelerated annual allowances which were introduced in 2013, are 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).

Policies for sustainable agriculture

▶ The Strategic Plan 2016- 2020

- ▶ A new development paradigm in the agricultural sector highly emphasises bio-food and bio-farming, to be achieved through the development of bio-production protocols, establishment of bio-farming zones, bio-food production and bio-farming certificate/label.
- ▶ The government policy is aiming as at the gradual shift to bio-farming with a target of achieving 50% of vegetables and fruits produced as per bio-norms by year 2020.

▶ Bio-farming Promotion Scheme

- ▶ To encourage the development of bio-farming activities on a commercial scale.
- ▶ The scheme include an income tax holiday for the first eight years of operation, Value Added Tax Exemption on production equipment and other inputs acquired for the implementation of the project, loan facilities at an annual interest rate of Key Repo less 1% (presently 3.4 %) over a period of ten years for maximum of 90% project financing under the MauBank SME Financing Scheme

▶ Mauritius Good Agricultural Practices MauriGAP

- ▶ Prepared and published by the Mauritius Standard Bureau in October 2015.
- ▶ efficient use of resources; adoption of environmentally sound practices for natural resources; biodiversity preservation; pre and postharvest best practices; workers' health and safety; and agricultural waste recycling.
- ▶ MauriGAP has been introduced with its Level 1 (Basic) and Level 2 (Advanced) to serve as steps towards Level 3 which corresponds to GLOBALGAP certification.

Climate compatible development in the manufacturing sector

- ▶ A green enterprise sector involves two main dimensions:
 - ▶ the first one is to deliver a green output while
 - ▶ the second one is to use increase resource efficiency, adopting practices which have low ecological risk.
- ▶ National Export Strategy 2017-2021
- ▶ The 10 year plan for SME Sector
- ▶ SME Development Certificate
 - ▶ SME Development Certificate introduced in 2016, which provides for an 8-year tax holiday and concessionary loans, for the production of renewable energy, and bio farming activities. In budget 2016-17, the SME development certificate was extended to sole traders and cooperatives.
- ▶ ISO 14001
 - ▶ Set out the criteria for an environmental management system and can be certified to. It maps out a framework that a company or organization can follow to set up an effective environmental management system.
- ▶ Eco-labelling for textile product
 - ▶ In 2016, the Mauritius Standard Bureau has implemented the standards for Eco Labelling for Textile products - MS 188:2016. The Eco labelling in this respect takes into account the minimisation of the use of environmental harmful substances, reduction of water and air pollutants, reduction of energy consumption and GHGs emissions, minimisation of waste generation and the adoption of sustainable forms of processes.

Climate compatible development in the energy sector

▶ Energy efficiency

- ▶ Energy Efficiency Management Office (EMO) is the leading department to energy efficiency development and promotion in Mauritius. It facilitates the management of energy efficiency in all sectors of the economy including transport, buildings, industry and services, as well as in households and fosters a culture of energy efficiency through awareness, capacity-building and support of initiatives.
 - ▶ Voluntary Scheme for Energy Efficiency Labelling of Electrical Appliances (refrigerating appliances, household electric ovens, electric dishwashers, room air conditioners, washing machines, electric lamps, tumble dryers, and television);
 - ▶ Energy Efficiency Awareness Campaign including talks on Energy Efficiency and Energy Saving)
 - ▶ Energy efficiency competitions,
 - ▶ Energy Observatory report,
 - ▶ Mandatory Energy Efficiency Labelling of Electrical Appliances (refrigerating appliances, electric ovens, electric dishwashers Appliances)
 - ▶ Mandatory Energy Audits,
 - ▶ Mandatory Registration of Energy Auditors, and
 - ▶ Monitoring of Energy in public sector buildings among others .

Renewable energy sector (cont.)

- ▶ The Small-Scale Distributed Generation (SSDG) scheme
 - ▶ assisted 237 households, schools and public institutions to install small-scale (<50 kW) photovoltaic (PV) panels and wind turbines through the provision of a targeted feed-in tariff scheme(GCF 2016).
 - ▶ The 2 MW capacity cap (in SSDG Phase 1) was reached in less than one year of the scheme. The 2 MW capacity cap (in SSDG Phase 1) was reached in less than one year of the scheme.
 - ▶ The extension of the scheme (SSDG Phase 2) led to an additional 0.94 MW being added within 12 months.
 - ▶ Currently, a net-metering scheme (SSDG Phase 3) is ongoing with no special feed-in tariff and is proceeding slowly given the lack of technical and financial support. The Government has, in its 2015-2016 Budget, stated its desire to scale-up the scheme (SSDG Phase 4) to encompass additional households and larger institutions.
- ▶ Mauritius Renewable Energy Agency (MARENA)
 - ▶ A new institution, the Mauritius Renewable Energy Agency (MARENA) has also been created for the promotion of Renewable Energy Technologies and to facilitate the implementation of projects

Renewable energy sector

- ▶ Over the recent years, the Government has put in place are several policies and programmes to promote in renewable energy sources.
 - ▶ **The Long-Term Energy Strategy 2009-2025 to increase renewable energy (RE) target of at least 35% of electricity production by 2025.**
 - ▶ Outline Energy Policy,
 - ▶ CEB's Integrated Electricity Plan.
 - ▶ Master Plan for Energy Efficiency/Demand Side Management and Action Plan for the period 2016 to 2030.

Renewable sources of electricity in Mauritius (percent)

	1990	2000	2010	2017
Hydro	10.87	5.40	3.84	2.90
Landfill gas	0.0	0.0	0.0	0.5
Wind	0.1	0.0	0.1	0.5
Photovoltaic				2.4
Bagasse	20.20	24.22	17.63	14.67
Total	31.17	29.62	21.57	20.99

Non-renewable sources of electricity (percent)

	1990	2000	2010	2017
Gas turbine (kerosene)	4.61	2.41	0.70	0.09
Diesel & Fuel oil	58.11	47.56	36.32	37.42
Coal	6.15	20.44	41.50	41.56
Total	68.86	70.40	78.53	79.07

Policies driving sustainable tourism

- ▶ Green loans which were provided by the two main banks (Mauritius Commercial Banks and State Bank of Mauritius) with the support of the Agence Francaise De Developpement, have fueled many projects in the hotel sector to reduce fossil fuel energy
- ▶ Local Government Act 2011
- ▶ The following items have been included in the Local Government Act 2011: Sound rain water harvesting system to be incorporated in the development project; plantation of trees in case any mature trees were removed; avoid impervious floor on the premise to allow for ground water infiltration; Use of photovoltaic cells as well as efficient energy efficient bulbs; composting and segregation of household waste

Policies driving sustainable tourism (cont.)

▶ Eco-labelling


- ▶ Ministry of Tourism and Leisure is also promoting the concept of eco-labeling which is a voluntary method performance certification and labelling that is practiced around the world.
- ▶ The characteristics of an eco-labelled tourist enterprise are (i) respect of socio-cultural authenticity, (ii) efficient use of energy and water, (iii) efficient waste management, (iv) judicious use of scarce and non-renewable resources and (v) greater material recyclability.

Policy framework for eco-tourism and sustainable tourism

- ▶ The National Energy Efficiency Programme by Business Mauritius
 - ▶ efficient practices based on energy audits.
- ▶ The Mauritius Standard (MS) 165 for sustainable tourism
 - ▶ Inspired from EcoMark Africa and the Global Sustainable Tourism Criteria (GSTC), taking into account the local specificities and context.
- ▶ 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).

Climate change adaptation

- ▶ Climate Change Adaptation Programme in the Coastal Zone of Mauritius



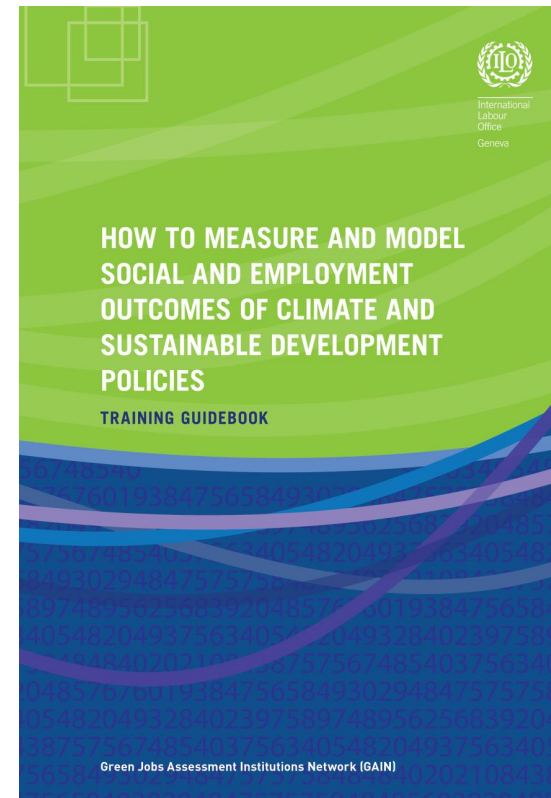
▶ Modeling output and employment effects of response measures?

Green economy policies, strategies and actions in Mauritius

- ▶ Assessments and diagnostic on Green Economy in Mauritius
 - ▶ **ILO Green Jobs assessment in Mauritius (2011 2012)** analyses the employment impacts of the transition in a number of sectors and subsectors including agriculture, fishing, manufacturing (textile), forestry, energy, tourism, and financial services.
 - ▶ The report concludes that green jobs was estimated at 6% in 2012 and with the appropriate green strategies, it can reach 10% in 2020.
 - ▶ ILO Skills for Green Jobs in Mauritius
 - ▶ ILO Greening of Mauritian Enterprises and
 - ▶ Stocktaking Exercise on Trade Union Involvement/Activities in Green Jobs in Mauritius
 - ▶ PAGE Tracking Public Sector Environment Expenditure and a Training Manual was

How to model response measures?

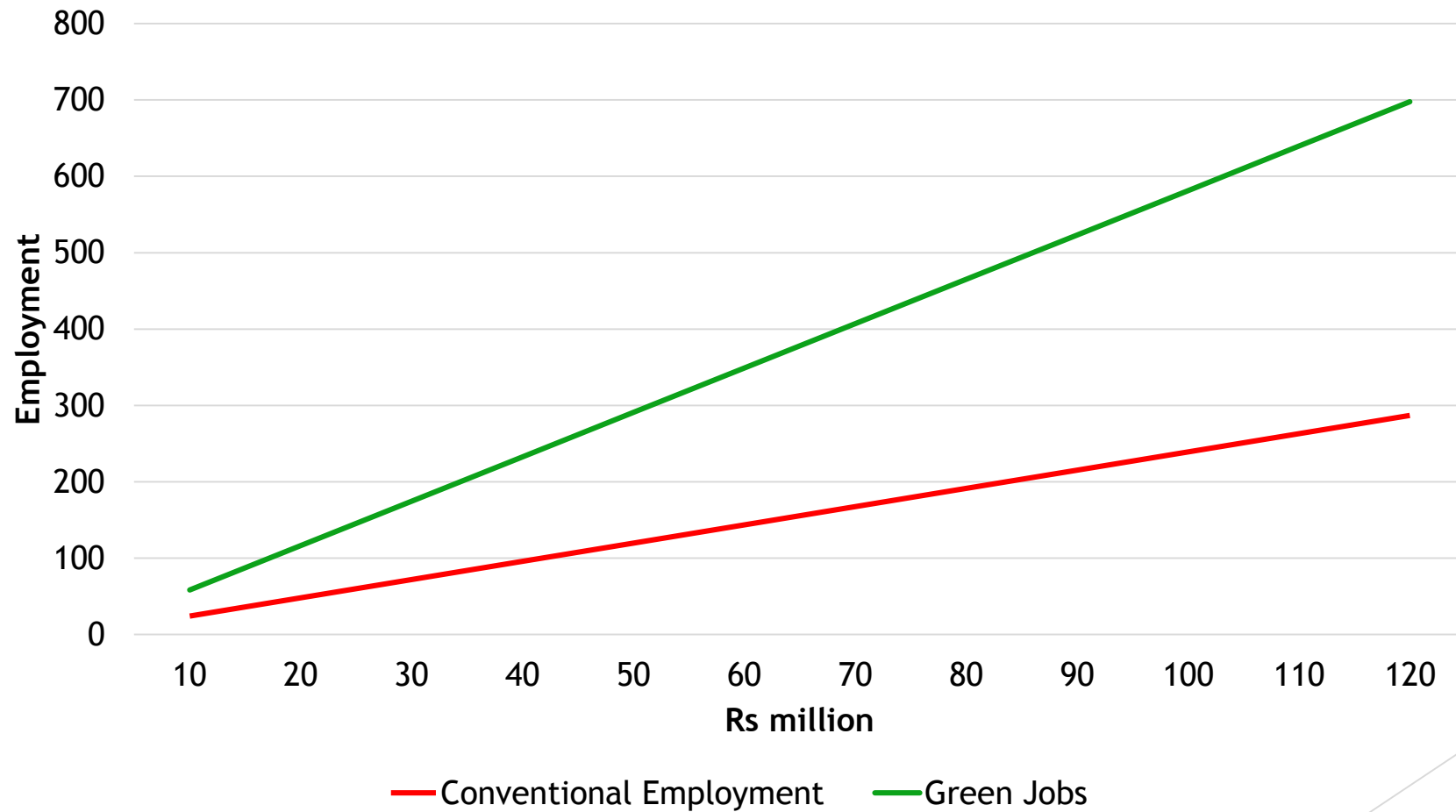
- ▶ Follows methodology of Green Jobs Assessment Institutions Network (GAIN)



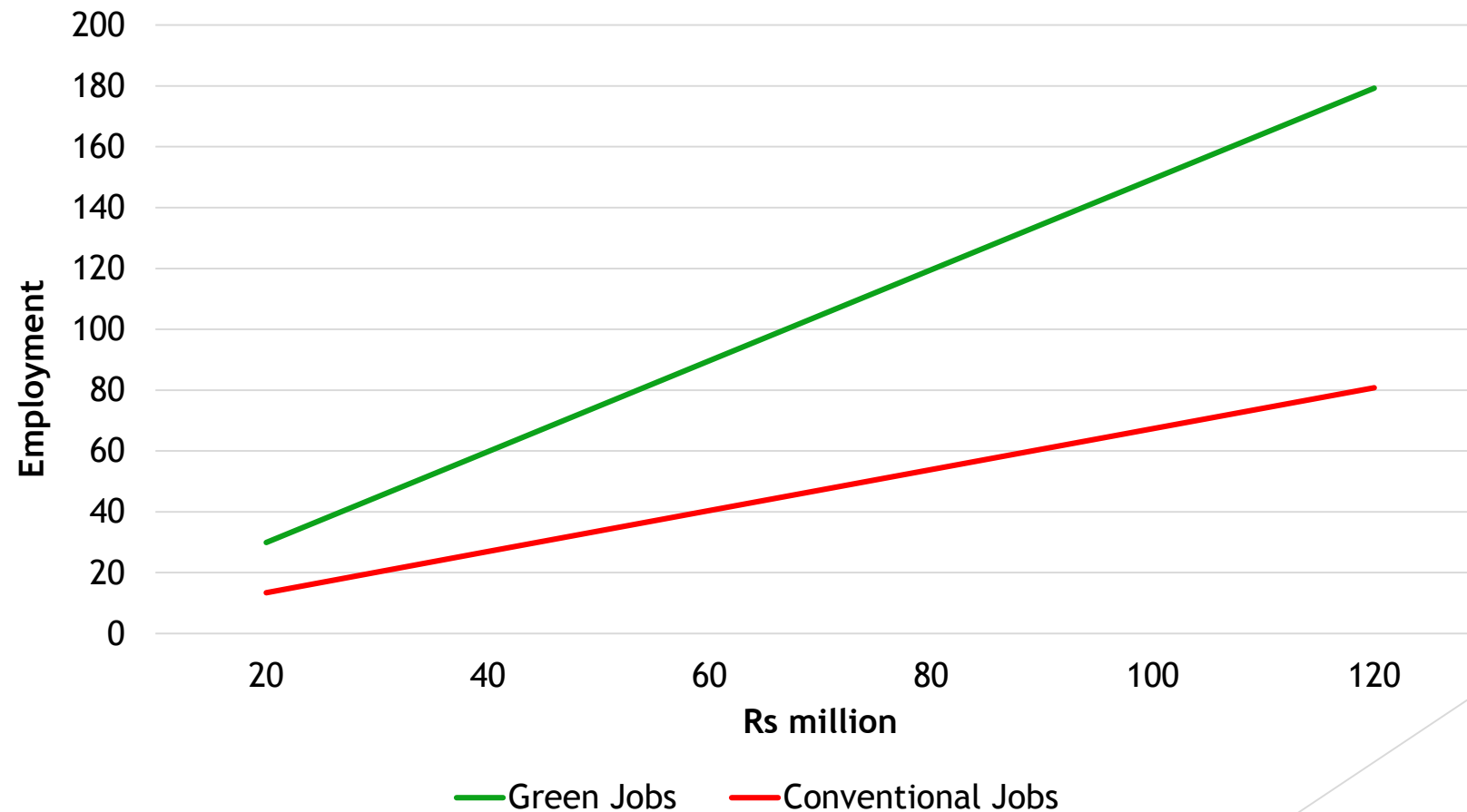
Assessment of response measures -Mauritian case study (ILO Team)

	Output multiplier	Direct jobs (Per Rs million)	Indirect jobs (per Rs million)	Total
Agriculture				
Conventional	1.21	2.28	0.29	2.57
Climate-based agriculture	1.30	2.28	0.41	2.69
Manufacturing				
Conventional	1.58	0.7	0.8	1.5
Energy efficient man	1.54	1.7	0.8	2.5
Services (Hotel)				
Conventional	1.37	0.67	0.55	1.23
Low carbon service	1.37	1.49	0.55	2.05
Electricity				
Fossil fuel	1.6	0.2	0.6	0.8
Low carbon electricity	2.5	0.2	1.2	1.4

Conventional Employment and Green Jobs in the textile manufacturing sector



Green Jobs versus Conventional Employment in the Hotel Sector



Modelling climate policy using the Input-output table

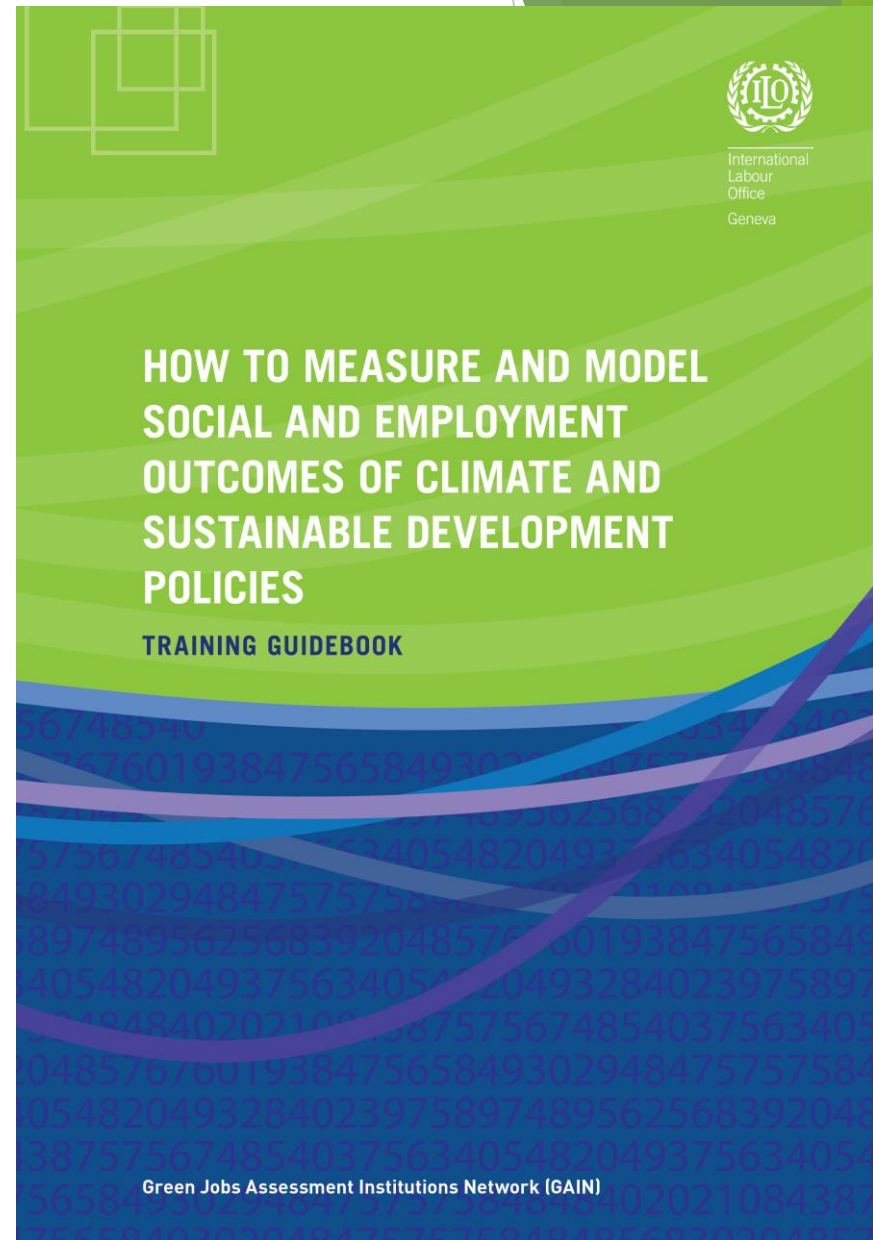
Climate policy, emission target, abatement technology, lower energy intensity



	Agriculture	Climate based agriculture	Manufacturing	Energy efficient manuf.	Service	Low carbon service	Final demand	Total
Agriculture	13	XX	27	XX	60	XX	50	150
Climate based agriculture	XXX	XX	XXX	XX	XXX	XX	XXX	XXX
Manufacturing	25	XX	55	XX	75	XX	40	195
Energy efficient manuf.	XXX	XX	XXX	XX	XXX	XX	XXX	XXX
Service	50	XX	55	XX	15	XX	50	170
Low carbon service	XXX	XX	XXX	XX	XXX	XX	XXX	XXX
Value added	62	XX	58	XX	20			
Total	150		195		170			

GAIN Training Guidebook

- ▶ Output effect
- ▶ Employment
- ▶ Poverty
- ▶ Gender issues
- ▶ etc



Key findings: modelling help to answer a series of questions

- ▶ Using the output and employment multipliers help to understand the impacts of respond measures
- ▶ Which sectors and sub sector have lowest or highest economic impacts?
- ▶ What are the short and long term economic impacts?
- ▶ Total jobs which are lost AND the employment which is generated...
- ▶ What are the **skill requirements**?
- ▶ Impacts on women, poor, income distribution