

TRAINING MANUAL

Understanding and Operationalizing the Green Economy into National Development Planning in the Caribbean Context

Enabling Economic Growth and Investment while
Increasing Environmental Quality and Social Well-being



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Background and Introduction

Within the past five years, Caribbean governments have been discussing the movement of the region towards a “green economy” (GE) to support the sustainable development of the region. In 2014, the Green Economy Caribbean Political Advisory Group (GEPAG) was formed and held its first meeting in May at the University of the West Indies. This group is being supported by the United Nations Environment Programme (UNEP) within its Green Economy Initiative (GEI). The GEI, launched in late 2008, has an overall objective to provide the analysis and policy support for investing in green sectors and in greening environmental unfriendly sectors.

UNEP defines a green economy as one that results in “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”¹. A green economy can reduce carbon dependency, improve climate change resilience, promote resource and energy efficiency and lessen environmental degradation and at the same time improve people’s livelihoods and reduce poverty.

To make the transition to a green economy, enabling conditions will be required at the national and international levels. These enabling conditions include national regulations, policies, subsidies and incentives as well as international markets, trade and technical assistance.

To support the Caribbean’s movement towards a green economy, the GEPAG is charged with undertaking research, outreach and capacity building in the public and private sectors in key areas that are needed to support different steps of a green economy transition. As a starting point, the group has conducted a capacity needs assessment to evaluate the capacity needs among decision makers in the Caribbean required to enable the transition to a green economy including:

- substantive capacities, such as the understanding of the green economy concept and the ways and means to incorporate green economy in national planning processes and sectoral policies and plans, highlighting the potential of green economy policies for achieving sustainable economic growth, poverty reduction and environmental conservation
- institutional capacities, including the ability to identify, design and introduce enabling conditions and tools relevant for a green economy transition, such as trade and investment policies
- process-related capacities (understanding of planning processes leading to the implementation of the relevant tools).

¹ UNEP Green Economy Initiative –
www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx

A training programme on moving toward a green economy will be developed to address the capacity needs identified in the assessment. This training programme will be delivered to professionals currently working in areas such as policy development, economic analysis and development, environmental management, in the public sector, private sector and in non-governmental and community organizations.

This programme will provide a model for integration of GE training within academic institutions. It is expected that this training will ultimately be institutionalized into modules of already existing courses being offered by selected tertiary institutions or offered as a stand-alone course as part of a degree programme, possibly at the Masters Level. The institutionalization of this GE training programme within tertiary institutions is being pursued as part of a plan to ensure that over time there will always be a set of skills in the region to implement actions in various sectors and disciplines to move towards a green economy. Also, this training programme will be a model for adaptation for small island developing states in other areas of the world, for example in the Pacific, Indian Ocean, Asia or Africa.

Purpose of this Manual

This document presents the training manual for the course, “Understanding and Operationalizing the Green Economy into National Development Planning in the Caribbean Context”. It is designed to engage professionals in the public and private sectors in discussion about what is required to transition to a green economy and to provide tools to enable them to do so. It is geared towards professionals who have responsibility for developing national finance, economic and development policies and who are working in areas of natural resources policy, conservation and management and in key sectors such as tourism, energy mining, transport and manufacturing.

The manual comprises five main modules as follows:

Module 1 – Introduction to the Green Economy Approach

Module 2 – Creating an Enabling Environment for the Transition to a Green Economy

Module 3 – Creating New Business in a Green Economy

Module 4 – Transitioning to a Green Economy in Key Sectors

Module 5 – Measuring Progress towards a Green Economy

The Learning Product

Understanding and Operationalizing the Green Economy into National Development Planning in the Caribbean Context

Course Description

This course on operationalizing a green economy has been designed to build capacity of key individuals in the public and private sectors to understand the importance of a transition to a green economy and to provide the tools to do so. The course will equip participants to develop policies and programmes to move the countries of the Caribbean toward achieving economic development that also facilitates the accomplishment of social and environmental goals. Participants on this training programme will be able to focus on different economic sectors of interest, examining sector-specific issues and tools to address these issues.

The course content is divided into five modules, and will be delivered over a 30-hour period (which is sufficient hours for a semester long course). Aspects of this curriculum will be used to develop a smaller course to be conducted at two national workshops as well as for a green economy conference to be convened in late 2014.

Target Group

The target group for this course is expected to include:

- Professionals who have responsibility for developing national finance, economic and development policies
- Professionals who have responsibility for developing policies that have impacts on the natural environment or interact with the natural environment (e.g. tourism, energy, agriculture, land use planning etc.)
- Professionals working in areas of natural resources conservation and management (e.g. in forestry, fisheries, agriculture, coastal ecosystems, watersheds etc.)
- Professionals in key sectors such as tourism, energy mining, transport and manufacturing – sectors that have the potential to impact the natural environment – but also sectors that can contribute to sustainable use and management of natural resources

Course Objectives / Learning Outcomes

Upon completion of this course, participants will be able to:

Knowledge

- Understand the key concepts of a green economy

- Know the key economic, environmental and social issues in the Caribbean
- Understand the linkages between key economic sectors and the environment
- Understand the benefits of moving to a green economy
- Know best practice case studies for a green economy and how they may be adapted locally

Performance

- Develop recommendations for national policies and institutions to transition toward a green economy
- Be able to infuse green economy and environmental issues into key national policies as a first step to enabling key sectors to be more sustainable
- Determine appropriate financial incentives to promote a green economy
- Develop policy recommendations for specific economic sectors
- Identify and/or develop appropriate indicators to measure progress toward a green economy

Attitude

- Better appreciate the importance of transitioning from the current economic paradigm to a green economy
- Appreciate that there does not need to be a trade-off between economic development and environmental quality
- Appreciate that a green economy is not a “luxury” and that small developing economies such as those in the Caribbean can and should move toward a green economy

Course Modules

This course is divided into five modules as described below.

Module 1 – Introduction to the Green Economy Approach

- Concepts and definitions of a green economy
- Rationale for moving toward a green economy
- Links between a green economy and sustainable development
- Linkages between key economic sectors and the natural environment
- Drivers of and opportunities for change in different Caribbean countries and sectors
- Benefits of a green economy transformation
- Barriers to change and what specific interventions and strategies can overcome them

Module 2 – Creating an Enabling Environment for the Transition to a Green Economy

- Requirements for a transition to a green economy
- Policy tools for a transition to a green economy
 - Government investments

- Market-based instruments
- Tools to facilitate and promote decision making for a green economy (e.g. environmental impact assessments, natural resource valuation)

Module 3 – Creating New Business in a Green Economy

- Transitioning to a green economy to reduce poverty
- Transitioning to a green economy to create employment

Module 4 – Transitioning to a Green Economy in Key Sectors

- Energy
 - Overview of energy sector in the Caribbean
 - Challenges and opportunities for renewable energy in a green economy
 - Enabling conditions - national policies, fiscal and economic incentives, capacity building
- Agriculture
 - Overview of agriculture in the Caribbean
 - Challenges and opportunities for agriculture in a green economy
 - National policies
 - Fiscal and economic incentives
- Tourism
 - Overview of tourism in the Caribbean
 - Challenges and opportunities for tourism in a green economy
 - Enabling conditions - national policies, fiscal and economic incentives, capacity building

Module 5 – Measuring Progress towards a Green Economy

- Caribbean indicators to track progress towards social, economic and environmental outcomes of a green economy
- Linking green economy indicators to the post-2015 development framework

Delivery Methodologies

A variety of learning delivery and assessment methodologies will be employed to enable the course to be very participatory and interactive and to allow participants to effectively assimilate the new ideas and learning. Participants will be provided with a Training Manual (participants' handbook and workbook).

Emphasis will be placed on adult learning methodologies which will include over the duration of the course:

- Lectures
- Analysis of case studies and class discussions of illustrative case studies
- Lecturettes (to include presentations from key experts etc.)
- Group discussions

- Individual and group work/assignments
- Oral and written presentations
- Individual readings outside of the classroom (in preparation for upcoming modules)

Assessment Methodologies

The participants will be assessed through course work and the group exercises as well as participation in discussions. Participants also will be required to undertake pre- and post-tests. The questions of the pre- and post-test are the same and this method is usually used to assess how much participants knew before the training and how the training built their capacity.

The course itself will be assessed using evaluations completed by participants. This will provide information that can inform the institutionalization of the course within tertiary institutions as well as the creation of shorter mini-courses.

Learning Resources

Examples of some of the learning resources for this course are:

- Caribbean Green Economy Manual (to be developed based on the proposed curriculum in this document)
- Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, UNEP, 2011
- UNEP Green Economy Briefing Papers
- Green Economy Developing Countries Success Stories, UNEP, 2010.
- A New Paradigm for Caribbean Development: Transitioning to a Green Economy, Caribbean Development Bank, 2014.

Participants will be provided with other documents, source materials and papers used in the development of the training manual, a range of websites from which they can find additional information and additional case studies.

Also, participants will be required to use their own country-specific documents such as national development plans, national sector plans (for energy, agriculture, tourism, transportation, etc.).

Certification

Candidates who participate in 80 per cent of this course, and who complete the group and individual assignments will be awarded a certificate of achievement jointly issued by the University of the West Indies and the United Nations Environment Programme.

Module 1

Introduction to the Green Economy Approach



Module 1: Introduction to the Green Economy Approach

Overview of Module 1

Module 1 presents an introduction to the green economy. It describes some of the international discussions that have given rise to the term and discusses varying definitions. This module presents a rationale for moving toward a green economy by describing current prevailing conditions which are not meeting the environmental, economic and social goals of sustainable development. The module examines the drivers and opportunities for change in the Caribbean that have led towards embracing a green economy approach and identifies some challenges to do so. This module also describes linkages between the natural environment and major economic sectors to provide a basis for understanding some of the necessary changes that must be made.

Objectives of Module 1

The objectives of Module 1 are to:

- Generate discussion about concepts, definitions and principles related to a green economy within the Caribbean context
- Make the case for moving toward a green economy
- Identify drivers within the Caribbean which are facilitating the move toward a green economy
- Discuss barriers that must be overcome to transition to a green economy
- Examine ways of strengthening and supporting intra-Caribbean and intra-SIDS cooperation on the green economy

Green Economy Definitions and Concepts

One of the most commonly accepted definitions of a green economy (GE) is the one put forward by the United Nations Environment Programme (UNEP) and promoted through its Green Economy Initiative². **UNEP defines a green economy as one that results in “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”.**

The concept of a green economy has its origins in discussions around environment and development that led to the discussion and promotion of the term “sustainable development” at the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro (known also as the Rio Summit or Earth Summit).

The term was revived and entered the international development discourse following the global financial crisis of 2008, as national governments and international organizations grappled with ways to reboot the economy in a more sustainable way. Several countries launched “green stimulus” programmes, which were essentially public sector incentive packages for private investment in “green” energy sources and technologies. UNEP was an early champion, launching its GE Initiative in October 2008.

The GE concept has also resonated in climate change mitigation discussions and it has become an important theme in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations.

The concept of a green economy is related to the ideas of green growth and low-carbon development as shown in the table below.

Green Economy	Green Growth	Low-carbon Development
A transition towards an economic model based on the sustainable generation of equitable social, environmental and economic benefits	The potential of green sectors and industries as engines of growth	Development emphasizing reduction in use of fossil fuels as the engine for development (also referred to as climate-resilient development)

² UNEP Green Economy Initiative – www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx

Definitions of a Green Economy

There are a number of different definitions of a green economy that emphasize different aspects. Some definitions (including the UNEP definition above) are:

- A GE is one that results in “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities” (UNEP)
- a GE is “an economy in which economic growth and environmental sustainability work together in a mutually reinforcing fashion while supporting progress on social development” (International Chamber of Commerce Green Economy Task Force)
- “Green growth means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. It focuses on the synergies and tradeoffs between the environmental and economic pillars of sustainable development” (Green Growth Knowledge Platform)
- Low carbon development strategies are “forward-looking national economic development plans or strategies that encompass low-emission and/or climate-resilient economic growth” (OECD)³

The concept of a green economy supports – and does not replace – sustainable development. But this new focus responds to two recent developments:

- There is a deeper appreciation today by many governments, companies, civil society and the public that we are reaching planetary limits, not just in terms of greenhouse gas emissions but also in our use of water, land, forests and other natural resources. The environmental and social costs of our current economic model are becoming more and more apparent.
- The global recession has led to a reconsideration of key tenets of the current economic model and adoption by a number of countries of programmes to promote “green” energy sources and to develop new markets and industries that can create good, long-term jobs

The promotion of a green economy was a key theme at the Rio+20 Conference held in June 2012 to mark the 20th anniversary of the Rio Summit. Governments agreed at Rio+20 to frame the green economy as an important tool for sustainable development – one that is inclusive and can drive economic growth, employment, and poverty eradication, whilst maintaining the healthy functioning of the Earth’s ecosystems.

Principles of a Green Economy

While definitions are useful for interpretation of the green economy concept, there has been an attempt to move beyond simple definitions of the green economy to define a set of guiding principles. These principles help to guide practitioners in the application of the green economy concept.

³ <http://sustainabledevelopment.un.org/index.php?menu=1448>

A number of sets of green economy principles were published by a variety of organizations in the lead up to Rio+20. An analysis of eight sets of principles was conducted by the United Nations Division for Sustainable Development that year (UNDESA, 2014). It found that there is a considerable diversity of principles that have been proposed to enhance interpretation and application of the green economy. However, there is also considerable synergy amongst the different sets of principles. The list of the most common green economy principles identified in the review are shown below.

Common Green Economy Principles

1. The green economy is a means for achieving sustainable development.
2. The green economy should create decent work and green jobs.
3. The green economy is resource and energy efficient.
4. The green economy respects planetary boundaries or ecological limits or scarcity.
5. The green economy uses integrated decision making.
6. The green economy measures progress beyond GDP using appropriate indicators/metrics.
7. The green economy is equitable, fair and just – between and within countries and between generations.
8. The green economy protects biodiversity and ecosystems.
9. The green economy delivers poverty reduction, well-being, livelihoods, social protection and access to essential services.
10. The green economy improves governance and the rule of law. It is inclusive; democratic; participatory; accountable; transparent; and stable.
11. The green economy internalizes externalities.

The Green Economy in the Caribbean Context

Green Economy Discussions in the Caribbean

The Caribbean has embraced elements of a green economy for some time through regional initiatives focusing on issues such as climate change, renewable energy and sustainable tourism. More recently, national policies have been developed in several Caribbean countries as leaders and decision makers seek to support sustainable development, sustainable energy and climate resilience.

In 2009 the late Prime Minister of Barbados David Thompson stated his aim to make Barbados the “most environmentally advanced “green” country in Latin America and the Caribbean”
- Barbados Advocate 31 March 2009

Examples of regional and national initiatives that promote a green economy

Regional Initiatives
CARICOM renewable energy programmes including the 1998 Caribbean Renewable Energy Development Programme (CREDP) that seek to reduce carbon emissions and promote the development of renewable energy
Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS) Framework within which initial targets for the contribution of renewable energy to total electricity generation have been established
Caribbean Alliance for Sustainable Tourism (CAST) established by members of the Caribbean Hotel Association in 1997 to promote responsible environmental and social management of natural and heritage resources respectively, within the hotel and tourism sector
CARICOM’s regional framework for climate resilient development – implemented by the Caribbean Community Centre for Climate Change (CCCCC)
Caribbean Natural Resources Institute (CANARI) Sustainable Rural Livelihoods Programme established in 2011 to support rural communities with the development of sustainable natural resource-based livelihoods through building capacity, catalysing partnerships and influencing policy to create an enabling institutional environment.
UNEP’s GE Initiative (GEI) - launched in late 2008 - with an overall objective to provide the analysis and policy support for investing in green sectors and in greening environmental unfriendly sectors.
Regional dialogue in 2009-2012 facilitated by CANARI to elicit ideas from a wide cross-section of Caribbean stakeholders on what Green Economy means in the Caribbean context (CANARI, 2012). The aim of this initiative was to facilitate the emergence of the Caribbean’s own unique development pathway and to inform international understanding and action.

Regional Initiatives	
Caribbean GE Action Learning Group (GE ALG), established in 2010, which was charged with identifying and promoting ways in which a “a Caribbean green economy” can advance sustainable development in the Caribbean.	
Green Economy Caribbean Political Advisory Group (GEPAG) formed in 2014 and charged with undertaking research, outreach and capacity building in the public and private sectors in key areas that are needed to support different steps of a green economy transition.	
National Initiatives	
Jamaica	Vision 2030, National Development Plan
Guyana	Low-Carbon Development Strategy
Dominica	Organic Development Policy – a low carbon climate resilient development strategy
Trinidad & Tobago	Valuation of ecosystem services into national accounting
Grenada	Alternative Growth and Poverty Reduction Strategy
Barbados	National GE Scoping Study with the support of the University of the West Indies and UNEP’s GE Initiative (GEI).

Group Exercise and Discussion

- Describe any plans or programmes in your country related to moving toward a green economy, highlighting the aspects that promote a green economy.

Rationale for Transitioning to a Green Economy in the Caribbean – Major Issues in the Caribbean

A green economy approach is expected to address the major problems affecting Caribbean countries and lead toward sustainable development – with its triple goals of economic, social and environmental welfare – in the region.

Poverty and social inequality

Per capita income ranges widely, from US\$24,233 in Trinidad and Tobago to only US\$949 in Haiti (CANARI, 2012). Many countries are classified as “middle income”, but with wide, and growing, economic disparities. For example, St. Vincent and the Grenadines, Saint Lucia and Jamaica are all estimated to have poverty rates of around 30 per cent. Levels of poverty and near-poverty have increased with the current economic crisis, with declining educational performance also contributing to rapidly increasing rates of unemployment. Poverty is often linked to issues of social inequality. The region has a large percentage of female-headed households, many below or close to the poverty line. Underproductive domestic sectors and dependence on volatile external markets have contributed to the persistence of poverty in the region.

Disaster risk

The region is highly vulnerable to natural hazards, including hurricanes, earthquakes, volcanic eruptions, floods and landslides, which have caused tremendous loss of life as well as environmental, social and economic impacts (in some cases approaching 200 per cent of GDP as in the case of Grenada and the Cayman Islands after the passage of Hurricane Ivan in 2004). Climate change is expected to increase the frequency and intensity of hurricanes, droughts and other climate-related hazards.



Public indebtedness

Levels of public debt have increased rapidly in recent years, with combined external and domestic debt ranging from over 70 per cent to nearly 200 per cent. The cost of debt servicing has been eroding state capacity, making this economic crisis feel especially acute. The burden of the adjustments that have been made to public services has been largely felt by those who need the services the most, thus contributing to further poverty and social inequity.

Diminishing sectoral benefits

Returns from key economic sectors have been decreasing. In the tourism industry, growth now brings only marginal net benefits to the region, largely because of the sector's heavy reliance on imported goods and services. The agricultural industry, vital to the rural economy, has been neglected. In the energy sector, unsustainable consumption and lack of investment are shrinking the benefit-cost ratio even in oil-producing countries such as Trinidad and Tobago. Recent emphasis on "sustainable tourism", "sustainable agriculture", and "sustainable energy" provide positive platforms for addressing problems in these sectors.

Climate change Impacts

Small island states have been identified by the UNFCCC as among the most vulnerable to climate change, particularly the impacts from sea level rise and increased frequency and intensity of hurricanes. The anticipated impact of climate change on the Caribbean is highly disproportionate to the region's small contribution to global greenhouse gas emissions.

Climate change poses a substantial threat to the Caribbean's population and infrastructure – most of which are in coastal areas which are more vulnerable. Climate change also has significant impacts on key economic sectors, particularly tourism and agriculture. These sectors already suffer periodic collapses following hurricanes and other natural disasters. Coastal erosion has been costly for the tourism industry, and sea

level rise will increase the impact. Climate change also poses a threat to scarce potable water resources on many islands. A study by the Caribbean Catastrophe Risk Insurance Facility found that annual expected losses from climate-related events already amount to 1 per cent to 6 per cent of GDP in some countries and that climate change could increase these losses by 1 to 3 percentage points of GDP by 2030 (CCRIF, 2010).

Caribbean Principles of a Green Economy

The key messages that grew out of the Caribbean GE dialogue are shown in the box below:

Key Messages from Caribbean Dialogue on the Green Economy

- There is need for a new model of economic development in the Caribbean.
- A shift to a more resilient and green economic pathway must be built upon a more secure, equitable and democratic foundation.
- A Green Economy in the Caribbean context aims for long-term prosperity through equitable distribution of economic benefits and effective management of ecological resources; it is economically viable and resilient, self-directed, self-reliant, and pro-poor.
- There are existing opportunities for moving towards a Green Economy in the Caribbean now.
- There is need for ongoing dialogue in what a Green Economy means in the Caribbean and how it can be implemented.

These key messages can lead to general characteristics or principles of a green economy that apply across sectors and institutions. A set of Caribbean principles emerged from the regional dialogue which can serve as guidelines for leaders in the public and private sectors when making decisions on how to operationalize a green economy. GE principles should be developed to meet the needs and vision of each country and each sector. The goal is not to simply arrive at a list of principles but to engage in discussion with stakeholders about the priorities and approaches to moving toward a green economy.

Caribbean Principles of a Green Economy

- Industries that optimise the relationship between demand and domestically produced supply
- Best practices which are rewarded and bad practices discouraged
- Businesses which apply “triple bottom line” principles to produce net flows of economic, social and environmental benefits

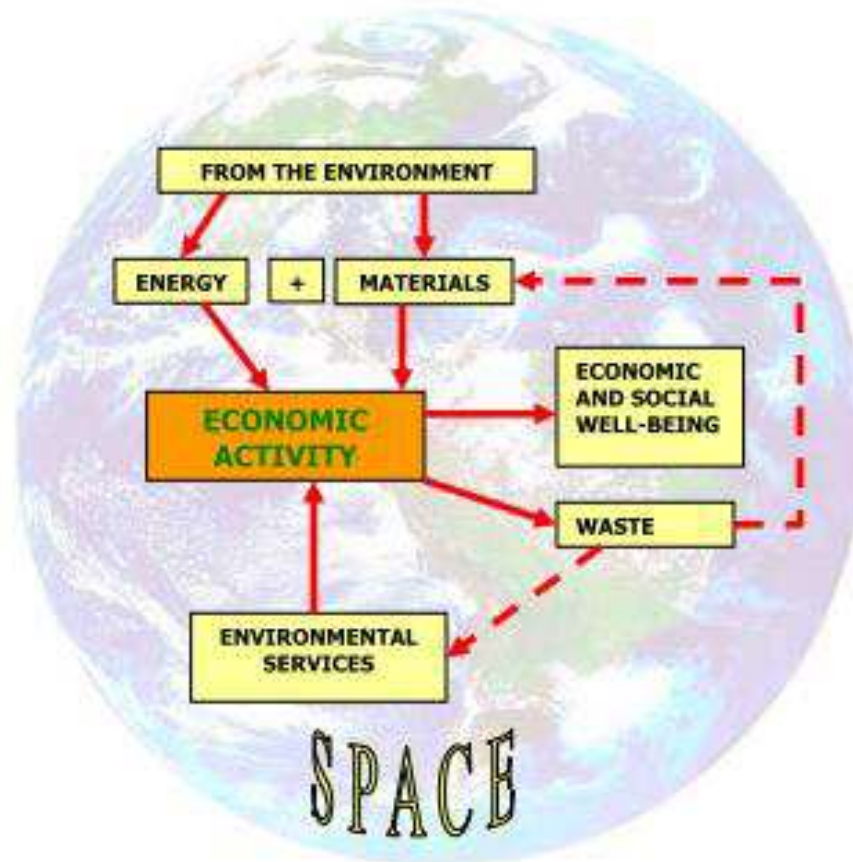
- The needs and constraints of specific groups such as female single heads of households are addressed in labour and welfare policies and practices
- Educational systems and options which offer young people knowledge, disciplines and skills that are relevant to their lives and potential career opportunities
- Dependency on imported or high carbon sources of energy is reduced and eliminated where feasible
- Available natural, human, cultural and physical resources are used efficiently, based on realistic assessment and optimal deployment
- Positive and mutually reinforcing intersectoral and rural-urban economic linkages are created

Group Exercise and Discussion

- For your country or your sector of interest, develop a set of Green Economy Principles economy.

Linkages between the Economy and the Natural Environment

To fully appreciate the concepts embodied within a green economy, it is important to recognize the linkages between the economy and the natural environment.



The above diagram depicts the important relationships between the economy, society and the environment. Economic activity, defined as the engine of growth of an economy and the basis for the level of well-being experienced by a society, is dependent on the environment for:

- Sources of energy and materials from the environment - the environment provides useful sources of energy and materials. Overuse of non-renewable sources of energy and natural resources can affect our economic activity.
- Sinks (the ability of the environment to assimilate waste from production processes) for waste and pollution
- Environmental services/ecological services of nature include water flow regulation, climate regulation, oxygen production, nutrient recycling, and waste

assimilation by water, air and land, radiation protection from the ozone layer. These are often ignored or undervalued.

- Space for people, infrastructure, nature and aesthetics

The diagram also shows that once economic activity takes place, it affects environmental and social well-being.

Some ecosystem services

The list of benefits provided by nature is vast. Ecosystems provide food, fresh water, climate and flood regulation, and recreational and aesthetic enjoyment. Forests store carbon, provide timber and other valuable products as well as habitat to a wide array of species. Wetlands purify water, offer protection against floods, produce oxygen, store carbon dioxide, and help to regulate climate. Mangroves protect coasts and coastal populations from storms and tsunamis. Coral reefs provide breeding grounds for fish and attractions for tourists. Rivers provide fish, water and facilities for recreation and also other ecosystem functions such as holding and circulating water.

The quantity and quality of waste generated can affect economy activity in two ways:

- Waste, if not properly managed, re-enters the environment and can negatively affect the environmental services, upon which economic activity depends
- Waste, if recycled or reused can re-enter the production process as material input and by so doing reduce the strain on the environment to supply additional quantities of materials for the production process.

Relationship between Environmental/ Ecological Well-Being and Economic Well-Being

Environmental well-being contributes to economic well-being when the environment is able to properly carry out its functions. The economic benefits of healthy functioning ecological services, nutrient cycling, flood control, climate control, soil productivity, forest health, pollination and natural pest control underpin the everyday functioning of the environment and many jobs.

Economic activity itself does not present a threat to the environment. It is the speed and scale of this economic activity which presents a threat to the integrity of the environmental support system that underpins economic activity. The environmental problems that the world is now facing lies fundamentally in the massive expansion of overall economic activities, the excessive consumption of resources, and the emission of wastes beyond the environment's capacity to assimilate.

While economic activity is essential for the provision of human well-being, economic activity that does not take into account its effect on the environment through the

overexploitation of materials and the unmanaged generation of wastes, will ultimately not only endanger further economic activity, but will result in negative impacts to human economic and social well-being.

Links between the Natural Environment and Three Key Economic Sectors in the Caribbean

Tourism

Tourism depends on the environmental quality of a destination – i.e. – clean air, water and land. It depends on the natural environment for its wide array of ecosystems, for example, beaches and coastal areas, mountains and forests.



Negative Impacts of Tourism

The negative effects which tourism may have on the environment include:

- Destruction of wetlands and mangroves as a result of the construction of resorts and hotels
- Loss of beaches due to sand mining, dredging near-shore and sewage dumping
- Reef damage from diving, anchors of yachts and cruise ships and the development of marinas
- Reduction in ecosystem productivity due to physical transformations of coastal environments caused by hotel and marina construction
- Disturbance and destruction of aquatic habitats as a result of tourist recreational outings
- Loss and displacement of biodiversity due to the destruction of forests and other land areas for building new resort areas
- Destruction of beaches due to continuous operation of motor vehicles on sand beaches which destroys sand stability and vegetation
- Pollution of the sea by faecal coliform and other pathogenic bacteria as many hotels do not have adequate or properly maintained disposal facilities, causing raw sewage to be flushed into the sea
- Pollution of ground water through the introduction of toxic chemicals, pesticides and herbicides used on golf courses and resort landscaping
- Contamination of groundwater as a result of inadequate sewage, solid wastes and industrial effluent disposal systems compounded by water sports and boat discharges.
- Depletion of groundwater as the tourist industry is the single largest consumer of treated water demanding as much as 10 times more than the domestic average

- Direct and indirect solid waste impacts – due to difficulty in siting solid waste disposal facilities and in supporting economically viable recycling programmes

Agriculture

The first and foremost role of agriculture is the production of food. However, agriculture and related land use activity have other functions which can be broadly characterized as follows:

- Environmental Functions - agriculture and related land use influence the natural resource system and can have either beneficial or harmful effects on the environment. This function is relevant to a number of critical environmental problems including loss of biodiversity, climate change, land degradation, reduction in water quality and availability and pollution
- Economic Functions – agriculture is responsible for the delivery of a wider range of non-
- food goods and services, as well as the provision of employment and livelihoods
- Social Functions – agriculture shapes social and cultural systems, including the maintenance of cultural heritage as societies still identify strongly with their historical origins in agrarian communities and rural lifestyles.



Environmental Services Vital To Agriculture

Environmental services vital to agriculture include:

- Soil Forming and Conditioning – Invertebrates develop upper soil layers through decomposition of plant matter, making organic matter more readily available, and creating structural conditions that allow oxygen, food and water to circulate
- Waste Disposal – Ecosystems recycle, detoxify and purify themselves, provided that their carrying capacity is not exceeded by excessive amounts of waste and by the introduction of persistent (synthetic) contaminants. (Nutrient filtering by mangroves can be likened to oxidation ponds of traditional wastewater treatment plants)
- Pest Control – Predator-prey populations create a self-regulating balance, whereby biological (inter-species) competition keeps more pests in check than could ever be accomplished through the use of pesticides.
- Biodiversity – Ecosystem stability depends on the results of competition between different species for food and space. It is this competition that increases species diversity.
- Pollination – 220,000 out of 240,000 species of flowering plants are pollinated by insects.
- Carbon Sequestration – Because biomass has the capacity to store carbon, where the soil is not tilled, or where minimum tillage is practised, soil contributes to carbon retention.

- Habitat – The provision of space, shelter and food for many important macro and microorganisms, such as earthworms.

Environmental Implications of Agriculture

The pressure to produce enough food has had a worldwide impact on agricultural practices. In many countries, this pressure has resulted in the expansion of agriculture onto marginal lands, mainly for subsistence purposes. In other countries, food needs have forced the expansion of irrigation and the steady increase in the use of fertilizers and pesticides, in order to achieve and sustain higher yields.

Some significant negative effects of conventional agricultural practices include:

- Degradation of agricultural land and decline in soil fertility continue to be major threats to food security, and sustained agricultural productivity, especially in developing countries.
- Reduction in soil productivity as a result of one or a combination of the following:
 - Wind and water erosion of exposed topsoil
 - The compaction of soil through intensive use of tractors and ploughs
 - The loss of soil organic matter and water holding capacity through overuse of fertilizers
 - The loss of biological activity
 - Salinization of soil and irrigation water
 - Overgrazing, which results in land degradation
- Excessive consumption of water – agriculture is the single largest user of freshwater resources in the world, using on average, approximately 70 per cent of all surface water supplies, most of which is recycled back into surface and/or groundwater sources.
- Water pollution - agriculture is the largest non-point source of water pollutants contributing to water pollution, for example, through the discharge of pollutants (fertilizers - nitrates and phosphorous - and pesticides) and sediment to surface and /or groundwater

Nutrient run-off has the ability to affect rivers, lakes and oceans, causing eutrophication and the creation of 'dead zones'. And while agriculture affects water quality it is also affected by water pollution through the use of wastewater and polluted surface and groundwater, which can:

- contaminate crops
- affect fishery production
- transmit disease to consumers and farm workers

Land degradation caused by poor agricultural practices can also affect water resources, reducing water availability and quality and altering the regimes of rivers and streams.

Potential impacts include flooding, silting of reservoirs and rivers, groundwater depletion, salinization of aquifers and pollution of water.

Energy

Fossil fuels (e.g. coal, oil, natural gas) are non-renewable sources of energy which come from the natural environment. Their increased use requires continuous imports by Caribbean countries which do not have their own supplies (Trinidad & Tobago being one notable exception). Continued and increasing use of fossil fuels also depends on seeking to exploit new sources which are either located in environmentally sensitive areas or must use more damaging extraction methods. Natural gas is the most environmentally benign fossil fuel and is relatively cheap to produce. These two factors have greatly increased the use of natural gas to generate electricity. Natural gas does cause air pollution but not as much as the other fossil fuels.



Impacts of Energy Use

The production, storage, transport and use of energy has effects on human health, ecosystems and biodiversity, climate change and the economy:

- Human health – The generation of electricity is responsible for the emission of sulphur dioxide, nitrogen dioxide, mercury and fine airborne particles, resulting in the deterioration of air quality. Nitrogen oxides, mercury and fine airborne particles aggravate asthma conditions, reduce lung functions and can cause respiratory diseases and premature deaths.
- Ecosystems and biodiversity – the mining, drilling and pipeline installation for the supply of energy can disrupt entire ecosystems. The combustion of fossil fuels emits gaseous pollutants which cause global warming, acid rain and smog. Smog can cause damage to crops, forest and property as it is formed from the combination of nitrogen oxides and reactive organic gases. Acid rain acidifies the soils and waters which can cause damage to plants, fish and the animals that they support. The extraction of coal from mines can cause severe erosion and the destruction of natural habitats and leaches toxic chemicals into nearby streams and groundwater supplies.

Although hydro power is considered to be a clean form of energy, the construction of dams for large hydro-power facilities has significant environmental impacts. These include the destruction of entire ecosystems such as rivers, having effects on fish and other water species, the loss of scenic natural

areas and reduced water flow for other uses. Large dams block the natural flow of water, thereby degrading water quality. However, small-scale hydro facilities are considered to be an environmentally-friendly form of energy.

- Climate change – Climate change is caused by many gases, referred to as greenhouse gases, of which carbon dioxide is the most significant. Energy production results in the emission of 80 per cent of global carbon dioxide. The two main anthropogenic sources of carbon dioxide emissions are fossil fuel combustion and land use changes, mainly deforestation. Energy's contribution to greenhouse gas production is greatest in the high-consumption industrialised countries.
- Economic effects – The production of energy from fossil fuels have significant economic impacts that are not reflected in the price of energy itself. Acid rain can cause significant damage to crops, forests, lakes and buildings and air pollution increases health care costs. Air pollution that has an impact on global warming has a potential cost from flooding and hurricane damage, low agriculture yields and population resettlement. Lost productivity due to workers emissions-related illnesses also comes at an economic cost to a country.

Barriers to Transitioning to a Green Economy

While the rationale for change is clear and there is an expressed interest in the region in moving toward a green economy, there are a number of barriers or challenges to making this transition.

BARRIERS AND CHALLENGES

Through its work with the GE dialogue in the Caribbean, CANARI has identified some primary barriers to transitioning to a GE in the region:

Political disincentives

Few politicians are prepared to take substantive leadership towards changes that could alienate powerful interest groups that benefit from the current paradigm. Divisive partisan politics in most countries reduces the ability of any government to achieve the political consensus required to make major policy shifts.

Weak bottom-up demand

Over the past twenty years the influence of civil society on national and regional development has declined significantly. Some of the roles once played by NGOs have been captured by the state and financial support for civil society work has therefore declined. Issues that created a sense of solidarity among civil society and academia in earlier decades are no longer on the table. Few young people are engaging in development action and debate. As a result, civil society organizations are becoming increasingly demoralized and dispersed, despite the continued leadership and engagement of a few.

Declining human resource base

The region has for decades suffered from significant brain drain and this is now being compounded by the poor performance of national education systems. In many countries, drop-out rates are at all-time highs, especially for boys, and rates of illiteracy and innumeracy are increasing. For example, over 70 per cent of boy school leavers in Jamaica failed their qualification exam in mathematics. Most countries also lack any system of training in skills that match the opportunities available. Skilled jobs are often outsourced or filled by persons from outside the country or region, and opportunities to add value to existing sectors through enhanced human resources are lost.

Outdated and inadequate regulatory frameworks

Existing legal frameworks and regulations do not encourage improved environmental and economic practices or innovations that could create new, sustainable economic opportunities. In some cases, they actually encourage perverse practices.

Group Exercise and Discussion

- Do you agree with the barriers identified by CANARI?
- What are the main barriers to developing a green economy in your country?

Module 2

Creating an Enabling Environment for the Transition to a Green Economy



Module 2: Creating an Enabling Environment for the Transition to a Green Economy

Overview of Module 2

Module 2 presents the requirements for Caribbean countries to move toward a green economy. The module describes a variety of policy tools that will help to undertake a successful transition and describes some supporting conditions that need to be established that will facilitate effective policy implementation.

Module 4 provides sector-specific discussion and policy recommendations.

Objectives of Module 2

The objectives of Module 2 are to:

- Identify the key conditions that must be in place for transition to a green economy
- Examine different policy tools that can enable the green economy transition
- Understand how to account for market externalities
- Determine appropriate market-based tools to facilitate the green economy transition

Requirements for a Transition to a Green Economy

To make the transition to a green economy, specific enabling conditions will be required. UNEP's Green Economy Report defines enabling conditions as conditions that make green sectors attractive opportunities for investors and businesses. If the right mix of fiscal measures, laws, norms, international frameworks, expertise and infrastructure is in place, then the green economy should emerge as a result of general economic activity.

Enabling conditions consist of national regulations, policies, subsidies and incentives, as well as international market and legal infrastructure, trade and technical assistance. Currently, enabling conditions encourage the prevailing economy, which depends excessively on fossil fuels, resource depletion and environmental degradation.

In addition to these policies, creating the right conditions for investment in the green economy requires a combination of capacity building, information sharing, dissemination of good policy practice, social assistance, skill development, general education and awareness to make sure that green measures are well designed, implemented, enforced and understood.

Enabling conditions can be created by a wide range of actors and entities, including, first and foremost, governments, but also regional organizations (such as CARICOM), multilateral environmental agreements – notably the United Nations Framework Convention on Climate Change (UNFCCC), international and national non-governmental organizations (NGOs), unions, and private sector actors from multi-national corporations and large firms to small and medium-sized enterprises (SMEs).

CANARI notes that there are fundamental pre-requisites for a transition to a green economy. Based on the regional GE dialogue, it suggests that a shift to a more resilient and green economic pathway must be built upon a more secure, equitable and democratic foundation. The key elements of that foundation include:

- A shared vision, across political parties, nations, and sectors of society, which demonstrates a sense of a shared Caribbean identity and commitment to the collective social good
- Human security, including equitable access to health care, education, and economic opportunity
- Good governance that is democratic and transparent and that encourages respectful dialogue involving all sectors of society
- A strong research and information base, for understanding the underlying causes of problems and developing effective and efficient solutions
- A well-educated citizenry that is exposed to a wide range of ideas and perspectives and has the skills and tools to participate actively in the economy

- Involved young people who have a vision of the region’s potential and the talents and motivation to become its future leaders
- An informed and mobilized civil society that takes a prominent role in national and regional debates on development priorities, that engages effectively with all sectors of society, that gives priority to the needs of the poor and marginalized, and that reflects a diversity of viewpoints and ideologies
- A commitment to pan-Caribbean cooperation across existing political, cultural and linguistic divides, that extends throughout the Caribbean diaspora, in order to expand economic markets and opportunities, facilitate the exchange of skills and labour, reduce dependence on uncontrollable external economic drivers, spread risk and increase resilience

Such a foundation would enable countries in the region to create a policy foundation for a green economy which UNEP has suggested should include:

- development of a regulatory framework to encourage green investment, protect environmental assets and set standards for sustainable production and consumption (including by governments themselves)
- protection of and investment in natural capital, including through incorporation of the value of natural capital into national accounts
- encouragement of low carbon technologies and green innovation through direct investment, tax incentives and other measures
- investment in work force reskilling to facilitate the shift from “brown” to “green” jobs

Policy Tools for a Transition to a Green Economy

Government policy plays a critical role within economies to encourage innovation and growth. A country's strategy for transition to a green economy may arise as a result of government decisions at the most senior level or may instead emerge gradually from initiatives being taken at a sectoral or sub-sectoral level by ministries and local government authorities, as well as in response to innovation from the private sector and civil society.

Selection of National Policy

Each country will need to prioritize its choice of policy based on a number of factors, including:

- **Existing development plans and commitments.** These include economic and development plans, national sustainable development strategies, poverty reduction strategies, national sector policies (e.g. for energy, tourism etc). To avoid duplication, policy tools for a green economy should complement and contribute to these existing strategies
- **National circumstances.** These include the cost of labour and capital, environmental and natural resource assets, availability of renewable energy resources, institutional capacity and governance strengths and weaknesses, political stability, demographic profile, and the strength of the private sector and civil society.
- **Sub-national differences.** In many cases, the greening of key sectors will have differential impacts on rural and urban areas.
- **Costs and timescales of different policies.** In some sectors, there are quick wins that can be targeted and achieved relatively quickly. Elsewhere, medium- to long-term preparation might be needed to overcome technical and political challenges. In some circumstances, such as investments in renewable energy, there might also be pressing reasons to act now to prevent significant future losses despite high financial and political costs in the short term.

A careful analysis of the above factors will also assist countries in assessing the feasibility of implementing a given policy reform or tool.

Promoting Investment and Spending in Areas that Stimulate a Green Economy

The careful use of public expenditure and investment incentives can play an important role in enabling markets to incentivize green economic activity and to attract investment from the private sector. Three important focuses for public spending are:

- promotion of innovation in new technologies and behaviours that are vital to green markets

- investment in common infrastructure that is required for green innovations to flourish
- fostering nascent green industries as part of a strategy to build comparative advantage and drive long-term employment and growth.

Public expenditure can be targeted specifically and strategically at changing market dynamics for green projects, sectors or investors. Considerable caution is needed, however, in considering such strategies because fiscal resources are scarce. Comprehensive analysis of national conditions and a range of potential interventions can help determine what to support and how – from investing in infrastructural improvements that will enable rural communities to embrace conservation agriculture, to establishing feed-in tariffs that will foster a new renewable energy industry.

Most interventions should:

- Be aligned with sustainable development priorities, taking into account possible impacts across economic sectors
- Be aligned, where possible, with strategies to strengthen a country's national comparative advantage
- Be solution-neutral, avoiding designating specific technologies or firms as champions, and allowing market forces to best determine how green outcomes can be achieved;
- Be strategically targeted to have long-term impacts on market dynamics, that will continue after the funding is withdrawn
- Be designed with mechanisms to control costs

Public Expenditure Measures

Many measures that governments can use to promote investment in the green economy can be considered a subsidy. Government subsidies for innovation may be needed where market barriers dissuade private investments, or where accelerating the development of an innovation is clearly in the public good. Innovation includes not only the development and deployment of new technologies, but also the modification of technologies to new contexts and the development of new behaviours. Short-term support from governments can give businesses the time they need to achieve competitiveness through producing at economies of scale, or establishing a customer base through market recognition.

CASE STUDY

In January 2009, at the height of the global recession, the Republic of Korea launched its national Green New Deal plan. At a cost of US\$ 36 billion, or approximately 3 per cent of GDP, the initiative aims to create 960,000 jobs based on green infrastructure projects and public services. The low-carbon projects include developing railroads and mass transit, fuel efficient vehicles and clean fuels, energy conservation and environmentally friendly buildings. Additional projects aim to improve water management and ecological protection.

Examples of public expenditure measures that promote innovation

- subsidies to parts of the research and development (R&D) chain, from basic research in universities to applied research in labs and industry, often on a cost-sharing basis
- support for the demonstration of projects with costs that are too high to attract private investors
- creating clear demand for technology in the marketplace, such that the private sector has a strong incentive to drive the innovation process
- creation of common infrastructure required to green economic activity, such as smart grids, or affordable access to broadband internet connections
- targeted support to key green industries

Examples of government investment incentives

Government Investment Incentive	Country Example
Foregoing government revenue - by reducing or removing fees	Turkey offers reduced licence fees for entities applying for licences to construct renewable energy facilities and provides deductions for the rent and right of access and usage of the land during the investment period.
Tax incentives and rebates, e.g. on property tax, import taxes and duties, sales tax etc. for purchase of green technology or services – note that a disadvantage of tax credits is that they do not lower the barrier of initial upfront payment, and therefore do not help low-income households as subsidies may	A number of municipalities in India have established a rebate in the property tax for users of solar water heaters. In some cases this rebate is 6-10 per cent of the property tax.
Accelerated depreciation, which allows an investor to depreciate the value of eligible fixed assets at a higher rate, which reduces the investor's taxable income – often used to encourage the	In Mexico, investors in environmentally sound infrastructure have benefited from accelerated depreciation since 2005, and in Hong Kong, buyers of environmentally friendly vehicles benefit from a reduction in

Government Investment Incentive	Country Example
production of energy from renewable sources	registration tax and other tax incentives
Loan support – through favourable lending conditions (such as loan guarantees or less stringent repayment conditions) or low-cost financing (such as subsidized interest rates or soft loans)	In Brazil, the São Paulo State Industrial Pollution Control Programme, established in 1980, provided preferential credit and technical assistance to polluters, making the pre-treatment process less burdensome. The project was funded by the state government and the World Bank.
Legislative support to favoured industries	The European Commission's Renewable Energy Directive requires EU countries to source 20 per cent of their energy from renewables by 2020 provides an incentive for development of renewable technologies.
Feed-in tariffs (FITs), requiring electricity suppliers to purchase electricity from renewable energy sourced producers at a pre-determined price that is sufficiently attractive to stimulate new investment in the renewable sector — this ensures that these producers have a guaranteed market and an attractive return on investment for the electricity they produce	Kenya has an FIT policy that stipulates long-term power purchase agreements of a minimum of 20 years for purchase of renewable energy from wind, biomass, small-hydro power, geothermal, biogas and solar energy. Targeted benefits are: additional renewables-based electricity generation capacity; enhancing employment and poverty alleviation in rural areas; and increasing income opportunities for business development.

Note that these policies all use scarce fiscal resources. Green industrial policy should be designed so that government investments are targeted at helping new industries mature, are closely monitored, and are strictly time-limited. Governments may consider conducting regular programme reviews, with agreed conditions for adjustment, as well as caps on total spending and clear sunset provisions. However, it is important that the support is stable and predictable, gives certainty to investors, and is phased out over time.

Green Public Procurement – A Special Type of Government Subsidy

Another type of government “subsidy” is green public procurement. Procurement of goods and services by governments and state-owned enterprises usually represents a large proportion of total public spending. Countries spend a considerable percentage of their GDP on procurement of such goods and services as buildings, rail and road

infrastructure, cleaning and other services, and purchases of office supplies and energy. By committing to purchase goods which meet certain criteria for sustainability, governments can therefore represent a powerful force of market demand.

Government demand for green goods and services can provide businesses with a high-volume and long-term buyer. Governmental purchase agreements can reduce uncertainty and spur market development through long-term contracts, pre-approved purchasing agreements and volume purchases. The market signal allows firms to make longer term investments in innovation, and allows producers to realise economies of scale, lowering costs. In turn, this can lead to the wider commercialization of green goods and services and thereby promote sustainable consumption.

Unlike most other subsidies, green procurement policies can be achieved largely through the reorientation of existing spending. It also provides governments with a valuable tool to demonstrate their commitment to sustainable development.

Group Exercise and Discussion

- Jamaica's Public Sector Procurement Policy includes a requirement that "goods and services to be supplied to government must comply with environmental regulations and standards. These relate to pollution control and prevention, waste management, recycling and water and energy conservation."
- Is this provision sufficient to make this a "sustainable procurement policy"?
- If not, what additional considerations would need to be added?

One study examining 10 product groups found that the most advanced sustainable public procurement programmes in Europe reduced the carbon footprint of procurement by an average of 25 per cent. The impact of Caribbean procurement policies on environmental goals has not been measured – there may not be the necessary data available to make this assessment.

One of the biggest hurdles facing governments is that environmentally and socially preferable goods and services can have higher up-front costs than less sustainable alternatives. There are a number of strategies to reduce these costs, such as:

- Focusing on goods and services that will have lower overall costs in the short-to-medium term once their efficiency gains in running costs are taken into account
- Considering long-term leasing of items such as electronic equipment, vehicles and furniture, which transfers the costs of maintenance, repair, upgrading and replacement back to the suppliers

- Transforming tenders for individual products into tenders for integrated services, exploring cooperative contracts and central purchasing platforms, through which the purchases of many agencies can be collectively negotiated to obtain sizable bulk discounts.

Ensuring Rational Public Expenditure

Direct spending

Direct spending to support the development of environmentally sound technologies may in some cases be preferable to tax incentives because it can be difficult to ensure that expenditure in the form of tax incentives promotes innovation that generates social rather than private benefits.

Performance incentives

Performance incentives can be used to ensure that economic activity is green. These incentives can be used to help reduce the cost of adherence to environmental and social standards without compromising those standards – for example establishing funds for the certification of management systems on environmental and social performance such as ISO 14000 series on environmental management and the ISO 14065 series on greenhouse gas monitoring.

Group Exercise

- Identify one example of a government investment incentive in your country that facilitates the transition to a green economy.
- Discuss what additional conditions or considerations could be added to improve its contribution to a green economy.

Market-based Instruments - Addressing Environmental Externalities and Market Failures

Supporting a green economic transition will require that governments address existing market failures such as:

- markets that are completely lacking, as is the case for many ecosystem services
- markets that fail to account for the true costs and benefits of the economic activity

Unsustainable economic activity often enjoys a price advantage when there is a

Externality – a cost or benefit that falls on third parties. This occurs when an entity takes an action but does not bear all the costs (negative externality) or receive all the benefits (positive externality).

Common negative externalities in economic sectors are:

- pollution
- health impacts
- loss of productivity
- waste

negative externality, where the production or consumption of goods and services has negative spill-over effects, the cost of which is not fully reflected in market prices. An externality means that the market price of an unsustainable good or service is lower than its actual social costs, with the difference borne primarily by people other than the buyer and seller. In addition to the problem of basic fairness, this is a problem because in order for markets to efficiently allocate resources, prices need to accurately reflect the full social costs of economic activity.

Market-based instruments can help to create a more level playing field between green activities and their unsustainable alternatives. Some of these policies also have the potential to increase public revenue, which could make an important contribution to the financing of a green economy.

Environment-Related Taxes

Pricing techniques can be used to internalize the cost of the externality in the price of a good or service via a corrective tax, charge or levy, also sometimes referred to as full-cost pricing. Such taxes can provide clear incentives to reduce emissions and use natural resources more efficiently and can stimulate innovation.

Environmentally related taxes can be broken down into two categories:

- **Polluter pays** – focused on charging producers or consumers at the point that they are responsible for the creation of a pollutant
- **User pays** – focused on charging for the extraction or use of natural resources

The revenue raised from environmental taxes can be used to:

- mitigate the damage done by unsustainable production and consumption; to promote green economic activity
- contribute to other priority spending areas

The overall tax burden can be kept unchanged by lowering negative incentive taxes simultaneously with the introduction of environment-related taxes (for example, replacing subsidies for fossil fuels with support for renewable energy). This can help make green taxes politically more acceptable and may also result in a double or even triple dividend – a reduction in pollution at the same time as an increase in efficiency and employment.

Key considerations for environment-related taxation instruments

- In cases where the activity should be prohibited, regulatory measures are typically a more appropriate instrument than taxes
- Green taxes will generally result in winners and losers within an economy. For example, low-income households are sensitive to any price increases and because energy use tends to use a higher portion of their total incomes, they might be unduly affected by a new tax

- Comprehensive research should be undertaken to estimate how green taxes will affect an economy and to help design complementary policies that can ease transition
- Consider offsetting any negative social impacts by rechanneling tax revenues into social welfare safety nets or other welfare-enhancing programmes
- It is important that policies be well communicated if they are to help overcome political opposition to change
- Public support for green taxation can be increased if governments introduce effective measures to ensure transparency and accountability

Removal of Environmentally Harmful Subsidies

Provision of subsidies can come at a cost to provision of important public services. According to analysis by the World Bank, a large number of countries spend more on fuel subsidies than they do on public health. Subsidies can also encourage poor environmental and resource management. Artificially lowering the price of goods through subsidization encourages inefficiency, waste and overuse, leading to the premature scarcity of valuable finite resources or the degradation of renewable resources and ecosystems.

Subsidies reduce the profitability of green investments. When subsidization makes unsustainable activity artificially cheap or low risk, it biases the market against investment in green alternatives. By artificially lowering the cost of using fossil fuels, such subsidies deter consumers and firms from adopting energy efficiency measures that would otherwise be cost-effective. There is consensus that these subsidies pose a significant barrier to the development of renewable energy technologies.

Global subsidies to fisheries have been estimated at US\$ 27 billion annually, at least 60 per cent of which have been identified as harmful, and are thought to be one of the key factors driving over-fishing.

The difficulty of reforming subsidies is practical and political: careful policy implementation is needed to offset undesired secondary impacts, and a combination of strong political will and compensatory policies may be necessary to overcome opposition from vested interests. In some cases, subsidy reform can negatively affect the welfare of the poor, and complementary measures will be required to ensure a socially neutral or ideally progressive outcome.

A strategy for reforming subsidies should include the following:

- Design of complementary measures, such as short-term restructuring aid for industries, support and retraining for workers and welfare transfers for the poor
- Wide stakeholder consultation
- A strong communication strategy to reassure affected groups that they will be supported

- Ongoing monitoring and review, essential to determine the effectiveness and any unintended consequences of subsidy reform, and whether the mitigation policies – especially financial support – are reaching their intended beneficiaries and achieving their objectives

Tradable Permit Schemes

Tradable permit schemes establish an overall level of pollution allowed and then let the open market determine the price. The UNFCCC's Kyoto Protocol provides countries with the ability to trade greenhouse gas emissions reduction credits. In total, the Protocol resulted in 8.7 billion tonnes of carbon traded in 2009 with a value of US\$ 144 billion (World Bank 2010).

CASE STUDY

The Clean Development Mechanism (CDM) was created under the UNFCCC to support emissions-reducing initiatives in developing countries. Projects that qualify to receive Certified Emission Reduction credits can sell them to historically high-emitting ("Annex 1") countries as "offsets", thereby helping those countries meet their emissions reduction targets. The qualification process for CDM projects is rigorous, and verification and other administrative requirements are significant. Two projects in the Region have qualified to date: a bagasse co-generation project in Guyana and the Wigton Wind Farm project in Jamaica.

For the CDM to effectively reduce global GHG emissions, it needs to become accessible to more countries, communities and small enterprises by adopting a programme approach that bundles small-scale initiatives and reduces transaction costs. The UNFCCC recently established an office in Grenada to encourage greater regional uptake.

Markets also exist for establishing payments for providing ecosystem services such as carbon sequestration, watershed protection, biodiversity benefits and landscape beauty. Payments for ecosystem services (PES) schemes aim to influence land use decisions by enabling landholders to capture more of the value of these environmental services than they would have done in the absence of the scheme.

The international PES scheme, REDD (Reducing Emissions from Deforestation and Forest Degradation) and the revised REDD+ were created to help reduce greenhouse gases and their contribution to climate change. REDD/REDD+ is a mechanism for transfers of finance between industrialized countries and developing countries in exchange for emission reductions resulting from activities that increase forest cover. The sums of money being estimated for full implementation of REDD+ are in the tens of billions of US dollars worldwide. The amounts committed so far provide grounds for optimism that this new mechanism can capture and transfer important new resources for ecosystem services provided by forests.

The IMF recommends a gradual reform strategy and suggests a number of potential short-term support measures, including the maintenance of subsidies that are most important to the budgets of the poor – mainly by replacing subsidies to producers with targeted consumption subsidies to poor households, and the redirection of funds into high priority areas for public spending, such as healthcare or education.

Group Exercise

- Identify one example of a market-based instrument in your country that facilitates the transition to a green economy.
- Discuss what additional conditions or considerations could be added to improve its contribution to a green economy.

Establishing Sound Regulatory Frameworks

A well-designed regulatory framework can create rights and incentives that drive green economic activity, remove barriers to green investments, and regulate the most harmful forms of unsustainable behaviour, either by creating minimum standards or prohibiting certain activities entirely.

Regulations provide the legal basis that government authorities can rely on for monitoring and enforcing compliance. A well-designed regulatory framework can reduce regulatory and business risks, and increase the confidence of investors and markets. It is often better for businesses to work to clear and effectively enforced standards, and not have to deal with uncertainty or face competition from those who do not comply with the rules. Moreover, regulations may also be particularly appropriate where market-based instruments are not applicable, such as where no market exists, for example, for ecosystem services.

In many cases, it is not necessary to establish new regulations, but instead existing regulatory frameworks should be better aligned with government objectives to promote green economic activity. This process has already started within many if not all Caribbean countries in response to their commitments to various multilateral environmental agreements and emerging sustainable energy policies.

To use regulatory tools to promote green economic activity in key sectors, it is important to first establish the extent to which existing regulatory frameworks are aligned with policy objectives. This makes it possible to decide which laws should be amended and whether or not any new legislation is needed.

Standards

Standards can be effective tools for achieving environmental objectives and enabling markets in sustainable goods and services. Standards inform consumers about products and production processes, and create or strengthen demand for sustainable products. Technical standards (i.e. requirements on products and/or processes and production methods) are developed and implemented mainly at the national level, although standards that aim at enhancing energy efficiency and that set targets for emission reductions are also developed internationally. The requirements may be based on the design or the particular characteristics required, such as many biofuel standards, or they may be performance-based, as is the case with many energy efficiency standards. Mandatory – as opposed to voluntary – standards can be very effective in achieving a desired outcome. Incorporation of energy efficiency into building codes is an example of standard setting.

The development of standards poses some risks. In many cases, it can be difficult to establish a standard with certainty. Also, a standard can eventually become obsolete and failing to adequately promote further improvements in performance. Complex standards also risk discriminating against small and medium-sized enterprises, which often lack adequate resources to comply with legislation and demonstrate compliance to regulatory authorities. To minimize these concerns, governments should establish mechanisms for regular review and revision of standards.

Property Laws and Zoning Regulations

It is evident that unless people have clear rights over a resource, they will lack the incentive to manage it well. In the case of agriculture, an absence or weakness of legal rights over farmland gives farmers little reason to manage it for the long term. Access rights can also have important effects on the management of a resource: there is little incentive for individual entities to make sustainable use of fisheries and water resources, for example, when they know that other users may simply increase their own use. This is the classic tragedy of the commons problem, and it can lead to degradation of ecosystems and the natural environment upon which Caribbean nations' economies and welfare depend.

Zoning regulations can be crucial in coordinating and integrating green infrastructure investments. Establishing strong zoning regulations would establish clear geographical limits around cities to restrict urban sprawl. Well-designed zoning regulations can also be instrumental to create green corridors that protect ecosystems or to prioritize the development of the poorest areas of a city in an environmentally sustainable manner.

Property laws and zoning regulations are politically challenging to establish and change. They may also have to address an additional layer of complexity when national legislation overlaps with international legislation, as in the case of transboundary fish stocks and cross-border water sources.

Voluntary agreements

Voluntary agreements and industry self-regulation measures are established by governments negotiating with firms, or by one or more firms taking voluntary action themselves, and usually consist of non-binding commitments to certain standards or principles. They can be a useful complement to government rules and regulations as they take away some of the burden of information and administrative costs from government authorities. Moreover, they can be in the interest of businesses if they involve cost-savings (eco-efficiency) or create positive branding. However, they are not a substitute for mandatory government regulations.

CASE STUDY

Sandals Resorts – the English-speaking Caribbean’s largest Caribbean-owned hotel chain – has participated in the voluntary EarthCheck benchmarking and certification programme for the past ten years. All properties participate in the programme which has green initiatives for waste management, energy and water conservation, control of hazardous substances, prevention of air pollution, and protecting marine life, coupled with staff awareness and community engagement.

Information-based tools

Information-based tools can be used to help promote a green economy. Examples are:

- Awareness campaigns to raise general understanding about a particular issue and potentially to achieve political buy-in and support
- Information programmes to teach basic skills and promote behaviour that reinforces green economy objectives
- Regulations to make the provision of certain information mandatory, to enable consumers and investors to more effectively assess the sustainability performance of firms, including their ecological and carbon footprints
- Voluntary certification and labelling programmes to help consumers make decisions that will be in keeping with a green economy
- Corporate social responsibility (CSR) programmes in companies

Group Exercise

- Identify one example of a standard, property law, voluntary agreement or information tool in your country that facilitates the transition to a green economy.
- Discuss what additional conditions or considerations could be added to improve its contribution to a green economy.

Supporting Actions for Policy Implementation

Supporting capacity building and the strengthening of institutions

There are three important capacity-building issues for transitioning to a green economy.

Improved information-based capabilities

Developing policy for a green economy requires the following to ensure policy effectiveness and accountability:

- Establish systems for research, data collection and data management
- Ensure that data and scientific analysis are appropriately factored into policy decision making

Integrated planning

A holistic approach to policy-making is necessary to ensure decisions are aligned with the overall objectives of a green economy. This includes:

- the development of processes and norms to systematize taking into account how policies in one sector might affect others
- carefully assessing decisions that have long-term consequences
- incorporating skills development policies
- using an appropriate mix of policy tools to achieve a given objective

Adequate enforcement of policy requirements and laws

To ensure that policy tools are appropriately implemented, the following systems must be put in place:

- Verification of the use of appropriate award of tenders in sustainable public procurement
- Ensuring that environmentally related taxation is being levied on relevant economic activity.
- Adequate monitoring of compliance
- Ensuring that appropriate penalties are levied where protocol and regulations are violated

Investing in training and education

Training and skill enhancement programmes will be needed to prepare the workforce for a green economy transition. In some cases, a transition to a green economy could mean that jobs would be lost, and in other cases, it is expected that new green jobs would be created. Available studies on a sectoral and economy-wide level suggest that, on balance, there will be more jobs in a green economy. Renewable energy, for example, creates more jobs per dollar invested, per unit of installed capacity and per unit of power generated than conventional power generation. Likewise, public transport tends to generate more employment than reliance on individual cars and trucks. It is also estimated that the pace of green job creation is likely to accelerate in the future.

To enable a transition to a green economy, the following will be needed:

- Focus education efforts on aligning skills with the needs of the labour market
- Ensure that managers develop the new perspectives, awareness and capacities required for ensuring a smooth transition.
- Support to shift workers to new jobs or provide social assistance.

“Businesses will need to ensure that their managers are able to learn and understand the new skills needed to respond to the changes taking place within their realms of responsibility; to develop more green-oriented managerial capacities; as well as to make adequate use of the skills their staff has obtained”
(OECD)

Group Exercise

- Identify one example of a supporting action related to capacity building or institutional strengthening in your country that facilitates the transition to a green economy.
- Discuss what additional conditions or considerations could be added to improve its contribution to a green economy.

Tools to Facilitate Decision Making for a Green Economy

Understanding the full range and value of ecosystem services can help governments and businesses make the most efficient, cost-effective, and responsible decisions. It can reveal opportunities for cost savings through timely or targeted action, such as where ecosystem services could be provided at lower cost than man-made alternatives (e.g., for water purification/ provision, carbon storage or flood control). In some cases, it may be sufficient to simply recognize the value of ecosystems and biodiversity to ensure their sustainability. These values can often be described in qualitative terms and reflect the intrinsic, spiritual or social value of nature.

In other cases, it may be necessary to determine the value of ecosystems and biodiversity in economic terms – through a method referred to as natural resource valuation – to ensure balanced and informed decision making. This is particularly true when policy makers and businesses make decisions impacting ecosystems based on a cost and benefit calculation. A failure to demonstrate ecosystem values in such cases can easily lead to perverse policy and business decisions. For instance, when considering the conversion of wetlands for agricultural or industrial use, a policy-maker would not have the full picture if the value of the wetland in terms of water filtration and flood control services is ignored.

Once values have been demonstrated, they can be captured through various policy instruments, such as Payments for Ecosystem Services (PES), which provide financial incentives for the responsible stewardship of the services.

Natural Resource Valuation

Natural resource valuation, or environmental valuation, is a series of techniques that economists use to assess the economic value of market and non-market goods, namely natural resources and resource services. It applies the welfare economics concepts of producer and consumer surplus to issues involving natural resources and the state of the environment. Welfare economics tries to answer the question “Is society better off?” Environmental valuation is the application of welfare economics when the differences in circumstances relate to the uses or states of natural resources or the quality of the environment.

Economic value is measured by the most someone is willing to give up in other goods and services in order to obtain a good, service, or state of the world. In a market economy, dollars (or some other currency) are a universally accepted measure of economic value, because the number of dollars that a person is willing to pay for something tells how much of all other goods and services they are willing to give up to get that item. This is often referred to as “willingness to pay.”

In assessing the value of some policy or management plan, the economist is interested in estimating how much an individual's (or society's) well-being would change: how much it will decrease if a natural resource were lost or increase if a natural resource or resource service were better managed or its quality improved. In other words, when economists try to estimate the economic value of a natural resource or resource service, they attempt to answer one of two questions:

- How much are people willing to trade (give up) of other goods and services to have some natural resource or resource service?
- How much better off would people be if a policy or management plan action was implemented and the amount or quality of a resource or resource service was improved?

The theory behind attaching economic value and cost associated with the ecosystem functions (e.g., clean air, freshwater, fertile soil and stable landscapes), is that decisions will be based on a more complete understanding of the full cost (i.e., the socio-economic opportunity cost) of development that alters the environment, directly or indirectly. For example, the cost of damage from past hurricanes would be reflected as an economic value associated with the protection of barrier reefs and mangroves, among others. Similarly, the cost of economic damage due to flooding and landslides is an economic value of maintaining adequate forest ground cover upstream.

CASE STUDY

Valuation studies demonstrated that self-financing is a viable option in many Caribbean protected areas, especially those that attract large numbers of visitors. Several protected areas now have effective revenue generation strategies, and as a result are among the best managed in the region. The most successful examples in the region include Nelson's Dockyard National Park (Antigua), Bonaire and Saba Marine Park, Brimstone Hill Fortress National Park (St. Kitts) and Pigeon Island National Park (Saint Lucia). Economic valuation played an important role in the establishment of these self-funded systems (NEPA, 2010).

Environmental Impact Assessment

Environmental impact assessment (EIA) is now a standard part of international development. In fact, EIA is a stipulated prerequisite for projects funded by the World Bank, IDB, USAID and EU. The purpose of an EIA is to identify and evaluate the potential impacts (beneficial or adverse) of development projects on the environment.

There is now little doubt that the environmental consequences of any proposed project or development need to be taken into account by decision makers along with the other

more conventional assessment criteria such as economic efficiency; for example the use of cost-benefit analysis and internal rates of return. Environmental Impact Assessment is now one of the tools used to determine the viability of a project and is particularly useful in the sense that it can be applied as early as the pre-feasibility stage of the project before enormous amounts of time, energy and money have been committed.

An EIA is a decision-aiding tool. Its ultimate objective is to give decision makers a clear picture of alternatives which were considered, the environmental changes which were predicted and the advantages and disadvantages of each alternative. The report that is produced usually includes a set of recommendations.

An effective EIA process should include:

- clear standards and requirements for documentation to be used in EIA preparation
- tools for the identification of significant impacts
- requirements for specification of impact mitigation measures and environmental management plans

By attaching financial and economic value to ecosystem functions, EIAs would allow for a more accurate representation of the costs associated with development. Thus, the decision-making process becomes a more holistic enterprise, one that better enables environmentally sound and sustainable development. However, there is a risk that the decision-making process will not adequately consider the economic values of ecosystem functions. These values may be heavily discounted on the basis of low or unknown probabilities and greater weight given to development on the basis of high priority short-term socio-economic benefits.

Module 3

Creating New Business in a Green Economy



Module 3: Creating New Business in a Green Economy

Overview of Module 3

Module 3 presents an overview of how a transition to a green economy can create new employment opportunities and reduce poverty. The module discusses issues related to the creation of green jobs and what are some of the enabling conditions for this to happen.

Module 4 provides some sector-specific examples related to the issues described in Module 3.

Objectives of Module 3

The objectives of Module 3 are to:

- Identify specific interventions in a green economy that can help to alleviate poverty
- Examine the green jobs discussion
- Identify the sectors which offer the best opportunities for employment in a transition to a green economy

Transitioning to a Green Economy to Reduce Poverty

Poverty alleviation is a key goal of transitioning to a green economy. Globally, 1.2 billion people are still living in extreme poverty⁴.

The livelihoods of many of the world's rural poor are intricately linked with exploiting fragile environments and ecosystems. Well over 600 million of the rural poor currently live on lands prone to degradation and water stress, and in upland areas, forest systems, and drylands that are vulnerable to climatic and ecological disruptions (UNEP, 2011). Despite rapid global urbanization, the rural population of developing countries continues to grow, albeit at a slower rate in recent decades. The primary cause of global poverty is the over-allocation of capital and investment into economic sectors and activities that lead to accelerated depletion of natural resources and ecosystems on which the poor depend for their livelihoods.

Millennium Development Goal #1

**Reduce extreme poverty
Halve between 1990 and 2015,
the proportion of people
whose income is less than
\$1.25 a day**

The global poverty rate at \$1.25 a day fell in 2010 to less than half the 1990 rate. 700 million fewer people lived in conditions of extreme poverty in 2010 than in 1990. However, at the global level 1.2 billion people are still living in extreme poverty.

Definition of Poverty

Poverty refers to living in a state of deprivation, which encompasses, among others, the following attributes:

- Material deprivation – lack of income, resources and assets
- Physical weakness – malnutrition, sickness, disability, lack of strength
- Isolation – illiteracy, lack of access to education and resources, peripheral locations, marginalization and discrimination
- Vulnerability – to contingencies which increase poverty (e.g. war, climatic changes, seasonal fluctuations, disability)
- Powerlessness – the inability to avoid poverty or change the situation

Poverty Levels in the Caribbean

Although many Caribbean countries have positive growth rates, approximately 38 per cent of the total population in the Caribbean can be classified as poor, with the highest incidence of poverty in Haiti (65%), Jamaica (30%) and Dominica (33%) (GOJ, 2008). The chronically poor in the Caribbean include those groups that are not active in the labour market. Also, most of the poor in the Caribbean live in rural areas. However, there are

⁴ <http://www.un.org/millenniumgoals/poverty.shtml>

increasingly rising rates of urbanization and high vulnerability of the urban poor to social and economic conditions, making urban poverty a particular concern for the Caribbean.

Opportunities for Reducing Poverty with the Green Economy

Initiatives aimed at greening the economy have shown to improve growth of GDP, especially the GDP of the poor, as well as the quality and quantity of jobs while increasing natural capital. UNEP research suggests that an investment scenario of allocating 2 per cent of global GDP to greening economic sectors will produce a higher global GDP, compared to a business-as-usual scenario – within only 10 years – see Figure 1 (UNEP, 2012c).

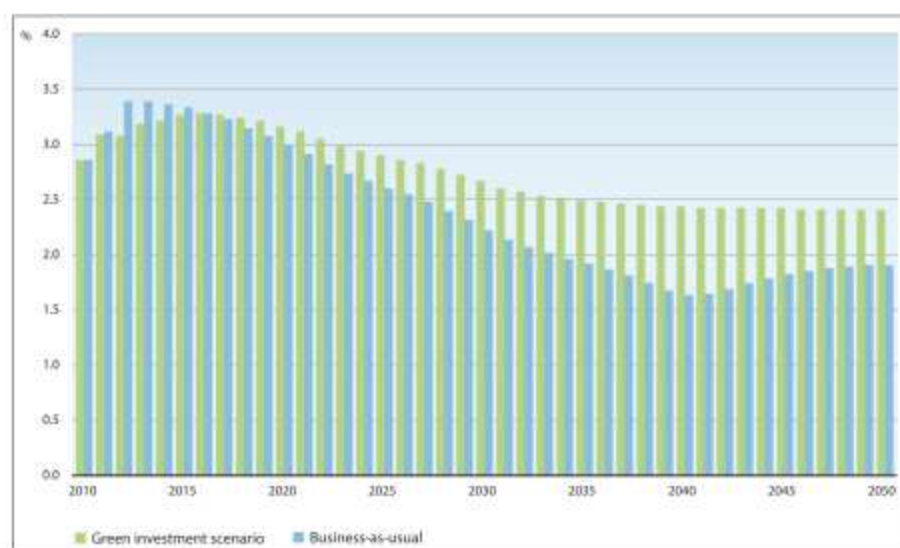


Figure 1: Projected trends in annual GDP growth rate.
(Source: *Modelling in Green Economy Report*, UNEP, 2011)

A package of green investments coupled with policy reforms aimed at making growth socially inclusive offers economically viable options to reduce poverty and hunger, and address challenges of climate change and degradation of natural resources, while simultaneously providing new and sustainable pathways to economic development and prosperity.

Green Economy Strategy	Impact on Poverty Reduction
Competitive poverty reduction and economic growth returns from green economy investments	Environmental improvements are consistent with wealth creation and GDP growth which reduces the incidence of poverty.
Greening agriculture reduces poverty and hunger, while building natural capital stocks	Greening small farms through sustainable farming practices could be the most effective way to increase food availability, reduce poverty, increase carbon sequestration and water efficiency, and at

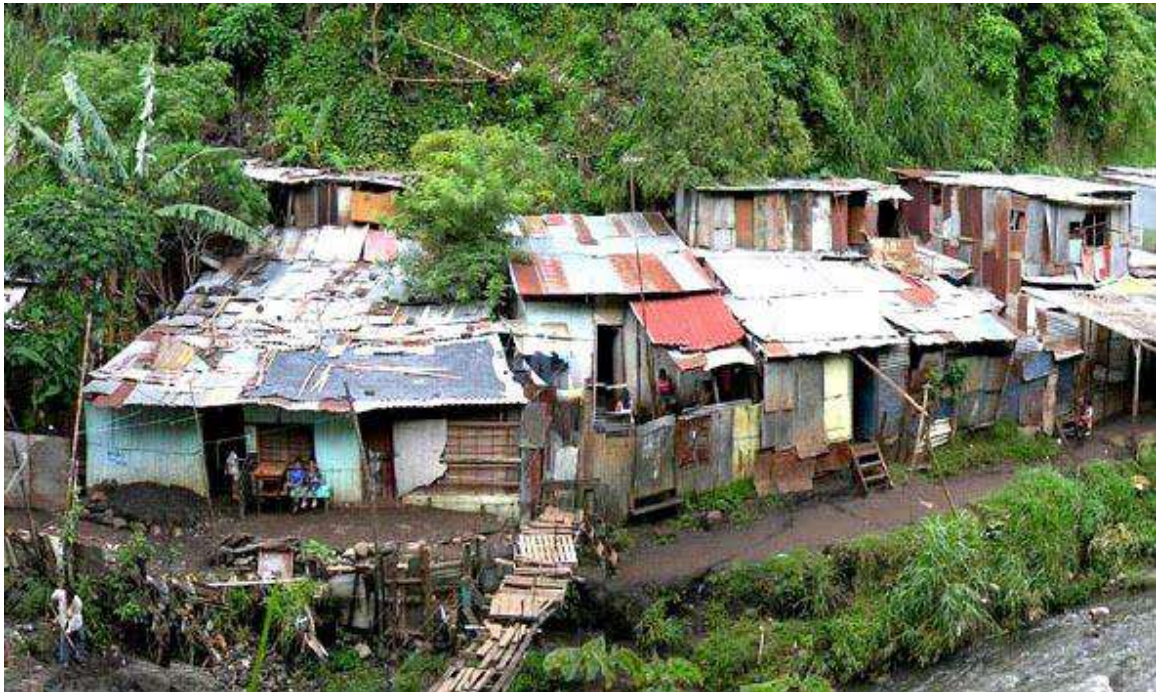
Green Economy Strategy	Impact on Poverty Reduction
	the same time link marginalized farmers with national and international supply chains.
Carefully crafted social safety nets build natural resources and reduce poverty	Social protection and livelihood security schemes for the rural poor can preserve and restore natural capital.
Investing in the provision of clean water and sanitation services benefits the poor	Lack of safe drinking water and sanitation has high socio-economic and environmental costs. Time and resources spent on buying or carrying water, and unhygienic conditions, are major causes of sickness and disease, especially for the poor. The lost employment days and health expenditure resulting from these diseases add to the economic burden.
Investing in renewable energy is a cost effective option for reducing energy poverty	Renewable energy solutions and supportive energy policies can make a significant contribution to improving living standards and health in low-income areas, particularly in rural areas. Some of the approaches which are cost effective solutions include modern forms of biomass and small-scale off-grid solar photovoltaic. Successful models have been developed to cover the initial investment costs.
Making tourism greener can support local economy and help reduce poverty. benefits to local communities and poverty reduction	Involvement of local communities in the travel and tourist industry has the potential to stimulate pro-poor growth. Communities have an opportunity to meet tourism needs that are locally supplied, such as products, labour, tourism services, and increasingly 'green services' in energy, water efficiency and waste management.

CASE STUDY

India's National Rural Employment Guarantee Act 2006 is a public work programme, guaranteeing at least 100 days of paid work per year to every household that wants to volunteer an adult member. Investment in 2010 amounted to over US\$ 8 billion, creating 3 billion workdays and benefitting 59 million households. Of these investments, 84 per cent was invested into water conservation, irrigation and land development, creating long-term livelihood opportunities for farmers.

However, it must be emphasised that moving towards a green economy will not automatically address all poverty issues. A focus on poverty reduction must be

superimposed on any green economy initiative. For example, investments in renewable energy will have to pay special attention to the issue of access to clean and affordable energy for the poor. Payments for ecosystem services, such as carbon sequestration in forests, will need to focus more on poor forest communities as the primary beneficiaries. The promotion of organic agriculture can open up opportunities, particularly for poor small-scale farmers who typically make up the majority of the agricultural labour force in most low-income countries, but will need to be complemented by policies to ensure that extension and other support services are in place.



Transitioning to a Green Economy to Create Employment

The greening of economies has the potential to be a new engine of growth, a net generator of decent jobs and a vital strategy to eliminate persistent poverty. Decent, green jobs effectively link Millennium Development Goal 1 (poverty reduction) and Millennium Development Goal 7 (protecting the environment) and make them mutually supportive.

Increased job benefits are often a main political “selling point” when a government is trying to introduce “green” policies. However, it is widely acknowledged that a green economy – and its promise of new decent jobs – will materialize only if the right employment policies are in place, which must include investing in human and social capital.

As the economy transitions toward a green economy, employment will be affected in at least four ways:

- In some cases, additional jobs will be created – for example, in the manufacturing of pollution-control devices added to existing production equipment
- Some employment will be substituted – for example, shifting from fossil fuels to renewables, from truck manufacturing to rail car manufacturing, or from landfilling to recycling
- Certain jobs may be eliminated without direct replacement – for example, when certain packaging materials are discouraged or banned and their production is discontinued
- Many existing jobs (such as plumbers, electricians and construction workers) may be transformed and redefined as skill sets and work methods are “greened”

Decent work

Decent work is defined as opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity.

Decent work sums up the aspirations of people in their working lives – their aspirations for opportunity and income; rights, voice and recognition; for family stability and personal development; for fairness and gender equality. Ultimately these various dimensions of decent work underpin peace in communities and society. Decent work is central to efforts to reduce poverty, and is a means for achieving equitable, inclusive and sustainable development. (ILO definition)

Source:

http://www.ilo.org/global/About_the_ILO/Mainpillars/WhatIsDecentWork/index.htm

Framing the Discussion on Green Economy and Employment

There are three intersecting lenses through which discussion is taking place about employment in the context of a green economy. These are shown in the table below along with their relative merits.

GE Employment Focus	Advantage of this approach
"Green jobs"	Provides a good slogan to engage the general public
Green products and services	Can measure contribution of purchase of these products and services to the total economy
Net employment impacts of policies and measures taken to "green" the economy	More holistic, looking at entire economy and can accommodate social concepts such as poverty alleviation

Green Jobs

There is no specific definition of a green job. Green jobs hold the promise that we will be able to:

- avert dangerous climate change and protect the natural environment which supports life on earth
- provide decent work and the prospect of well-being and dignity for all



A green job has been loosely defined as "one which pays decent wages that can support a family, which provides a real career path and upward mobility and which reduces waste or pollution or provides some other form of benefit to the environment."⁵

Green Products and Services

The global market for green products and services is projected to double from US\$1,370 billion per year at present to US\$2,740 billion by 2020 (UNEP, 2008). Half of this market is based in energy efficiency and the remainder in sustainable transport, water supply, sanitation and waste management. If requisite data collection systems are in place, data for imports and sales of green products and services can be obtained and measured over time. Categorizing products and services as "green" is not exact and may omit certain items which should be included, but green products and services could include the following:

- **Pollution Control** – products or services that prevent, treat, remediate or control environmental damage to air, water and soil. The remediation, abatement, removal, transportation or storage of waste.
 - Waste collection, disposal, remediation and engineering services
 - Waste transportation
 - Muffler/exhaust repair
 - Organic foods
 - Phosphate-free laundry detergent
 - Air and water filters and purification equipment

⁵ Walsh, B. (2008) TIME Magazine Going Green: What is a Green Collar Job, Exactly? Published May 26, 2008.

- **Renewable/alternative Energy** – products and services that provide clean energy and reduce fossil fuel use
 - Utilities and engineering services for hydropower, solar, wind, cogeneration electricity generation
 - Biofuels
 - Energy-from-waste services
 - Photovoltaics and other solar energy equipment
- **Energy Conservation** – products and services that conserve energy to reduce fossil fuel use
 - Mass transit services and equipment
 - Alternative fuel vehicles and hybrids
 - Green building construction
 - Energy efficient appliances
 - Insulation materials
 - Automatic environmental controls
 - Bicycles
- **Resource Conservation** – products and services that promote water, raw material, land and species and ecosystem conservation
 - Recycled, used, rebuilt or scrap metal products
 - Particle board
 - Nature parks, botanical parks, zoos
- **Environmental Assessment** – products and services that involve environmental assessment, consulting, testing, monitoring, detection, inspection, planning, law, policy, education, research and study
 - Environmental engineering, consulting and law services
 - Environmental testing laboratories
 - Environmental, conservation and wildlife organizations
 - Regulatory safety inspections, emission testing services

Note that certain green services do not constitute decent work. For example, many current recycling jobs recover raw material and thus help to alleviate pressure on natural resources, but often use processes which are dirty and dangerous, causing significant damage to human health. Employment in this industry tends to be precarious and incomes are low. If green services are to help lead to sustainable development, this must change.

Net Employment Impacts of Policies and Measures Taken to “Green” the Economy

As the economy goes through a green transformation, there is great potential for the creation of new jobs in areas such as organic farming, energy efficiency, renewable energy (solar, hydro, wind, biomass and biofuels), waste recycling, sustainable transport and the building sector (including construction, retrofitting, lighting and appliances). Reducing technology cost and improving quality of clean energy technologies increase their potential to create jobs.

Net gain in jobs in the transition to green economies stems from new markets being created (such as in waste management and recycling) and value chains in green sectors often being longer and more diversified than in conventional sectors (e.g., renewable versus fossil fuels). This leads to the creation of indirect jobs, as well as induced effects through increased demand.

Large-scale pro-poor programmes also have great potential for job creation. These programmes can have employment factors of around 1,000 jobs per million US\$ spent, which is much higher than those typical for clean energy programmes of 2 to 10 jobs per million US\$ (UNEP, UNDESA and FAO, 2012). For example, India's Rural Employment Guarantee Act described in the previous section provided an estimated 10 million jobs associated with an investment of US\$8 billion in 2009/2010.

A UNEP/ILO green jobs report suggested that the number of green jobs in the world might increase from 2.3 to 20 million from 2006 to 2030, which implies creation of 750,000 green jobs per year (59% in biofuels, 31% in solar PV). This will contribute to the creation of the estimated required 63 million decent new jobs per year until 2050 (UNEP, UNDESA and FAO, 2012).

Business Opportunities from Transition to a Green Economy

The sectors which offer the greatest potential for better employment opportunities in a green economy are renewable energy, building and construction, transportation, basic industry, agriculture and forestry. Furthermore, energy and raw material efficiency, and also renewable energy, can have an induced employment effect. Money saved on the energy bill is spent on other goods and services instead which generally generates more employment than the conventional energy sector, which is very capital-intensive. Table 1 shows environmental measures in these key economic sectors.

Table 1: Environmental measures in major segments of the economy

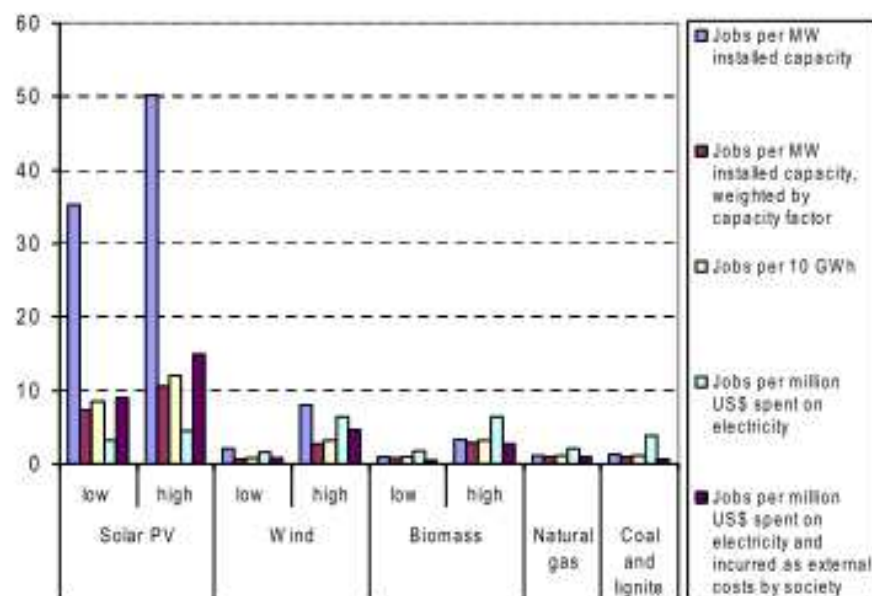
Sector	Environmental Measure
Energy supply	Integrated gasification/ carbon sequestration
	Co-generation (combined heat and power)
	Renewables (wind, solar, biofuels, geothermal, small-scale hydro); fuel cells
Transport	More fuel-efficient vehicles
	Hybrid-electric, electric, and fuel-cell vehicles
	Car-sharing
	Public transport
	Non-motorized transport (biking, walking), and changes in land-use policies and settlement patterns (reducing distance and dependence on motorized transport)
Manufacturing	Pollution control (scrubbers and other tailpipe technologies)
	Energy and materials efficiency

	Clean production techniques (toxics avoidance)
	Cradle-to-cradle (closed-loop systems)
Buildings	Lighting, energy-efficient appliances and office equipment
	Solar heating and cooling, solar panels
	Retrofitting
	Green buildings (energy-efficient windows, insulation, building materials, heating, ventilation and air- conditioning)
	Passive-solar houses, zero-emissions buildings
Materials Management	Lighting, energy-efficient appliances and office equipment
	Recycling
	Extended producer responsibility, product take-back and remanufacturing
	De-materialization
	Durability and reparability of products
Retail	Recycling
	Promotion of efficient products and use of eco-labels
	Store locations closer to residential areas
	Minimization of transportation distances (from origin of products to store location)
Agriculture	New service economy (selling services, not products)
	Soil conservation
	Water efficiency
	Organic growing methods
	Reducing farm-to-market distance
Forestry	Reforestation and afforestation projects
	Agroforestry
	Sustainable forestry management and certification schemes
	Halting deforestation

Source: Green Jobs - Towards Decent Work in a Sustainable, Low-Carbon World, UNEP/ILO/IOE/ITUC, September 2008

Energy

Discussion on green jobs has focused largely on the energy sector. More than 2.3 million green jobs have been created in recent years in the renewable energy sector (UNEP/ILO/IOE/ITUC, 2014). Countries with active policies to promote renewable energy have seen employment increase in this sector. Advocates of renewable energy typically emphasize the fact that renewable electricity is associated with 5 to 40 times more jobs per MW than fossil fuel-based technologies. In terms of jobs per dollar spent, wind power and biomass-based power are more attractive than the higher-cost solar PV and more attractive than most oil and coal-fired power facilities. Solar PV is the most attractive in terms of jobs created per dollar spent on electricity by consumers and incurred as external costs by society (Figure 2).



Data sources: Kammen et al. (2006); Huntington (2009); Hirschberg (2009).

Figure 2: Employment creation performance of power sector options⁶

CASE STUDY

Some 70 per cent of the population of Bangladesh, mostly in rural areas, do not have access to electricity. Grameen Shakti (GS), a not-for-profit company, has helped more than 100,000 rural households to install solar home systems. This has been one of the fastest-growing photovoltaic programmes in the world, expected to install 1 million systems by 2015.

GS operates a small loans scheme which enables even very poor rural households to buy a system without subsidies. The scheme also creates local jobs and income opportunities. Some 660 local youngsters and women have already been trained as certified technicians in the repair and maintenance of PV systems. Another 5,000 are planned. Many more jobs are created indirectly as solar systems enable local entrepreneurs to start up new businesses such as community TV shops, solar-charged mobile phone centres and electronic repair shops. GS is aiming to create 100,000 jobs in renewable energy and related businesses (UNEP, 2010).

Energy efficiency, particularly in buildings and construction

This is one of the areas with the highest potential to reduce greenhouse gas emissions and to create jobs in the process. Buildings are responsible for 30–40 per cent of all energy use, greenhouse-gas emissions and waste generation. The construction and renovation of buildings also represents the sector with the highest technical and

⁶ UNEP, UNDESA and FAO, 2012

economic potential for reducing emissions. Using current technology, high performance buildings have the potential to cut energy costs by at least 80 per cent compared with traditional building construction. Jobs in this sector are likely to be performed by people who already work in the building sector, but will be redefined in terms of new skills, training and certification requirements.

The great majority of efficiency measures, especially in the building sector, show positive employment and economic effects. A study undertaken in 2000 by the British Government concluded that, for every \$1.4 million invested in residential energy efficiency, 11.3-13.5 full-time equivalent (FTE) jobs were created (UNEP, 2011). Half the economic potential for efficiency gains in buildings is located in developing countries, but no data on existing or potential jobs are available for that part of the world.

Transportation

While efforts are being made to reduce the footprint of cars, public transport systems offer lower emissions and more green jobs. Only some 250,000 jobs in the manufacture of fuel-efficient, low-pollution and low-emissions cars can be considered green, in comparison to over 5 million jobs in the railways in China, India and the European Union alone, and millions more in public transport worldwide.

Railways can generally be regarded as sources of green employment. Unfortunately, in many countries, the trend over the last few decades has been away from this mode of transport, and towards cars, trucks, and planes.

Statistics show that some 1.3 million people work in public transport in the European Union and the United States. Public transport is a growth sector as countries commit to low-carbon development, particularly in the mega-cities of the developing world. Bus rapid transit systems are being put in place in more cities around the world, providing affordable and reliable public transport options. There are also substantial green employment opportunities in retrofitting diesel buses to reduce air pollutants, and in substituting cleaner compressed natural gas (CNG) or hybrid-electric buses.

Basic industries and recycling

Industrial sectors such as those of iron and steel, aluminum, cement, pulp and paper account for a large proportion of the use of energy and raw materials, along with greenhouse gas emissions, but a relatively small proportion of global employment. Greening basic industries is difficult and fewer than 300,000 jobs in iron, steel and aluminum can be considered “green”.

The best option for reducing the impact of these industries is through recycling. Secondary steel production, based on recycled scrap, requires 40–75 per cent less energy than primary production and can therefore be seen as a proxy for greener production. Worldwide, 42 per cent of output was based on scrap in 2006. It is

estimated that more than 200,000 jobs across the world are involved in secondary steel production.

Recent reports put the number of recycling and remanufacturing jobs in the United States at more than 1 million. Jobs in this sector in Western Europe and Japan can be assumed to be even more numerous, as these regions have achieved higher rates of recycling than the United States. In China, an estimated 10 million people are employed in all forms of recycling, with 700,000 in electronics recycling alone. In addition, communal recycling and composting efforts are likely to account for many more jobs.

Many existing recycling jobs cannot be considered green because they cause both pollution and health hazards and are not examples of decent work.

Agriculture

Agriculture is still the single largest employer in the world, with 1.3 billion farmers and agricultural workers in total. Decades of neglect and deteriorating prices have led to unsustainable land-use practices, bad jobs and low incomes, resulting in farmers and agricultural workers constituting the largest set of poor people in the world. Agriculture is both extremely vulnerable to climate change and a major contributor to it. It is also a major user and polluter of water, a driver of deforestation and of loss of biodiversity. There is considerable potential to create green jobs in this area by implementing sustainable farming practices, organic production and climate change mitigation efforts.

Small farms are more labour intensive. With adequate technical and infrastructural support, yields from small farms using crop rotation, manure use, natural pesticides, and other sustainable methods can match larger but often more environmentally damaging facilities. The potential for green and decent work is considerable and the environmental benefits could be enormous.

With sales reaching \$100 billion in 2006, organic farming is beginning to register an impact. More labour intensive than industrialized agriculture, the conversion of farmland for organic production could provide a good source of green employment in the future. A study of 1,144 organic farms in the United Kingdom and Ireland showed that they employed one third more full-time equivalent workers per farm than conventional farms. Organic agricultural land generally accounts for a small percentage of total agricultural land. An increase in this portion would result in many additional jobs.

Employing rural dwellers to repair and protect the natural environment could generate a large number of jobs. In South Africa, a public “Working for Water” programme has provided work for 25,000 previously unemployed people. Terracing or contouring land, building irrigation structures, conserving water and other related activities are labour

intensive and will therefore provide employment, as will the rehabilitation of dams and embankments.

Forests

Forests play a major role in maintaining the world's natural life support systems. Forests serve as carbon sinks and therefore are an important part of the climate change initiatives that seek to reduce GHG emissions. Forests also are sources of renewable raw material, pools of biodiversity, regulators of water flows and other environmental services, and thus it is clear that green jobs in forests will play an increasingly important role in the future.

Investment in a Green Economy

Investment in clean development and in green jobs has been growing fast in recent years, which creates employment. Global investment in clean technology expanded by 60 per cent from \$92.6 billion in 2006 to \$148.4 billion in 2007 and currently, many major companies worldwide are talking about investing in climate solutions. Increasingly, green employment creation is the consequence of conscious decisions of companies to adopt more sustainable business practices, and the recognition by venture capital firms that clean technology development offers significant business opportunities. Many of the companies driving renewable energy solutions prize employees who are skilled, take individual initiative, and are oriented toward problem solving. The majority of the pioneers consist of small and medium-sized companies, but larger, more established companies are currently joining the effort.

Employment Challenges in the Transition to a Green Economy

Greening the economy will involve large-scale investment in new technologies, equipment, buildings and infrastructure, and could thus be a major stimulus for much-needed employment. But additional employment potential can be realized only if the labour market is supported by adequate policies governing, for example, retraining of workers and development of new skills or employment services facilitating the reallocation of labour. Developing training programmes for relevant skills, including entrepreneurial skills and apprenticeships for green jobs could particularly help young people to become engaged in greening their economies.

Developing a green economy will also require a just transition for those who now hold jobs in carbon-intensive and polluting industries. For labour unions, already concerned about wages and job security in an uncertain world, this transition is a major challenge. Also, a transition towards a green economy does not automatically lead to more "decent" work. The implementation of adequate policies and strong labour market institutions will be required. These policies and institutions need to promote a just and inclusive transition. A broad social acceptance for such a transition is also necessary and this is only possible if peoples' livelihoods and working conditions are taken into account

by policy makers. In designing green economy policies governments will need to implement supportive measures to ensure positive change in employment.

While a transition to a green economy is likely lead to a global net increase in employment, some countries are expected to benefit more than others. Net job creation will depend on a country's production and R&D capacity, natural resources, labour supply, energy and trade policies. Countries which facilitate the creation of green RD&D and production jobs will benefit most. An increasing number of these jobs will be created in emerging economies. In fact, in 2008 public and private energy R&D in BRICS countries⁷ was US\$18 billion, or three times that in the United States of America (UNEP, UNDESA and FAO, 2012). Overall employment in resource extraction sectors will continue to decline, irrespective of the extent of green growth policies and therefore, adjustment and retraining measures are essential. The challenge is to make added employment through green jobs offset job losses in a transition to a green economy.

CASE STUDY

The United States Virgin Islands are investing in R&D to position itself for a transition to a green economy – and to befit the Caribbean region as a whole. The University of the Virgin Islands Caribbean Green Technology Center was developed to foster research, education and public service on sustainability, to promote Caribbean inter-Islands' cooperation, to advance interdisciplinary investigations and learning, to collaborate with governmental agencies and industry partners and to research, develop, demonstrate and monitor green technology. The Center addresses scientific, policy and implementation issues around the topic of green technology and sustainability, especially as it pertains to living in the Caribbean and has four work programme areas: education and outreach, research, policy and workforce development.

⁷ Brazil, Russia, India, China and South Africa, considered to be at a stage of newly advanced economic development

Module 4

Transitioning to a Green Economy in Key Sectors



Module 4: Transitioning to a Green Economy in Key Sectors

Overview of Module 4

Module 4 presents an analysis of three key economic sectors in the Caribbean – energy, agriculture and tourism – and how they can be repositioned to facilitate a green economy. This module examines energy as a cross-cutting issue and identifies areas for development and use of renewable energy as well as increasing energy efficiency in sectors such as transport and manufacturing. The module presents issues and strategies for transitioning to a green economy in agriculture and tourism, examining issues related not only to energy but also to the use of the natural capital upon which they are based.

Module 4 provides some sector-specific examples of general tools and approaches described in Module 2.

Objectives of Module 4

The objectives of Module 4 are to:

- Identify the key issues related to three key economic sectors in the Caribbean
- Discuss enabling conditions required for transitioning to a green economy in these sectors
- Explore sector-specific approaches to move toward a green economy



Globally, energy use has climbed steadily over the years, as industrial economies have expanded and developing countries have experienced both industrialization and economic growth. There are however, wide disparities both within and between developed and developing countries. The high income countries with about 20 per cent of global population account for about 60 per cent of commercial energy usage.

Almost 80 per cent of energy consumption is derived from fossil fuels. In 2012, oil accounted for 40.7 per cent, natural gas 15.2 per cent, coal 10.1 per cent, biofuels and waste 12.4 per cent and other sources (including geothermal, solar, wind etc.) a mere 3.5 per cent. Electricity accounted for 18.1 per cent energy consumption – most of which was generated from fossil fuels. In 2012, 67.9 per cent of electricity generation was from fossil fuels (40.4% coal, 22.5%, natural gas and 5.0% oil), with 16.1 per cent from (primarily large-scale) hydro, 10.9 per cent from nuclear sources and 5 per cent from other sources(IEA, 2014).

The World Energy Council's 2010 Assessment of countries' energy and climate policies concludes that the energy sector is responsible for 60 per cent of the global GHG emissions and much of regional and urban air pollution.

Much of the interest in green economy in the Caribbean revolves around its implications for the energy sector. Most Caribbean countries clearly want to reduce dependence on fossil fuels through the development of indigenous alternative sources that are more sustainable (with a focus on renewable energy) and the promotion of energy efficiency.

Energy in a Green Economy

Greening the energy sector refers to increasing energy efficiency (on both the supply and demand side) and obtaining a much greater supply of energy services from renewable sources, both of which will lead to reducing greenhouse gas emissions (GHG) and other types of pollution. This will enhance energy security at global, national and local levels.

Greening the sector also aims to end “energy poverty” for the estimated 1.4 billion people who currently lack access to electricity. Also it aims to provide healthier and more sustainable energy sources for the 2.7 billion people who are dependent on traditional biomass for cooking (UNEP, 2011).

Transformation of the energy sector to more sustainable solutions will address climate change concerns as well as economic development and energy access through the deployment of renewable energy and energy efficiency and conservation in the electricity, transportation and other sectors.

The energy sector has a key role to play in all sectors of the economy.

Renewable energy sources (renewables)

Renewable energy sources diversify a country’s energy supplies and reduce its dependence on non-renewable fossil fuels which will eventually be depleted. Renewable energy sources are also cleaner than fossil fuels, emitting fewer greenhouse gases and other air pollutants that are responsible for harming human health.

Green transport

Fuel efficiency for public and private vehicles is a critical part of “greening” both the energy and transport sectors. Efforts in the energy sector to move toward green transport also include the use of clean fuels to minimize pollution. Natural gas is an alternate fuel to gasoline and diesel which is being actively explored – for public transport fleets in the short term and for private vehicles in the longer term. Although natural gas is a fossil fuel, it has less of an environmental impact than oil and diesel.

Green buildings

With respect to energy, green buildings involve increased energy conservation and efficiency among government facilities, factories, offices, homes and hotels etc. The ultimate green building (with respect to energy) would be a carbon neutral building that would use no energy from the national power grid.

Sustainable agriculture and forests

Making the most efficient use of non-renewable energy resources is a key element of sustainable agriculture. The development of biofuels such as ethanol and biodiesel – a key strategy to increase the use of renewable energy and increase fuel diversification –

creates new opportunities to diversify the agricultural industry and enhance its social and economic impact. Also, the energy sector is responsible for encouraging a reduction in fuelwood consumption and the accompanying deforestation. The creation of fuelwood forests is another intervention which contributes to reduced removal of natural forests for fuel wood.

Water services

Water obtained from aquifers using electric/petroleum-fueled deep well pumps requires the use of energy. This is of particular concern in the agriculture sector, which uses a large portion of many countries' water (for example, in Jamaica, 75 per cent). Implementing water-conserving irrigation systems will not only result in less water being consumed for agriculture but will also reduce the energy needs of the agriculture sector as well.

Waste management

Energy-from-waste is an effective method of waste management and waste volume reduction with the added benefit of generating clean energy. Potential exists for the development of renewable energy sources which can be exploited from municipal solid waste as well as from wastes generated from agri-business and wastewater treatment. Energy-from-waste can make a significant contribution to achieving renewable energy targets⁸ while at the same time, treating waste that cannot otherwise enter a waste minimization or recycling/composting programme. Waste-to-energy processes can reduce the incoming volume of waste by about 90 per cent, thereby reducing the need for land space to create new dumpsites. Furthermore, combusting municipal solid waste rather than depositing it in a dumpsite results in a reduction in greenhouse gas emissions.

Clean technologies

Major industries such as the bauxite/alumina industry can be encouraged to take greater advantage of co-generation potential to supply energy to the national grid. New technologies also need to be introduced to reduce the energy cost of production to make it internationally competitive. Greater application of combined heat and power (CHP) concept, can enable capture of waste energy, reduce cost and at the same time allow for export of surplus electricity to the national grid.

Overview of the Energy Sector in the Caribbean

All CARICOM Member States depend heavily on fossil fuels to supply their energy demand. Only one country, Trinidad and Tobago, is a major producer and only net exporter of petroleum, petroleum related products and natural gas. In 2005 Suriname exported some amount of crude oil but imported LPG, gasoline and diesel oil.

⁸ Countries can decide whether to consider energy-from-waste constitutes a renewable resource. According to the IEA's definition of renewable energy, it does not.

Consumption of petroleum products within CARICOM, totaled 224,000 boepd with Jamaica with the greatest consumption, followed by Trinidad and Tobago and the Bahamas (CARICOM, 2013). Most of the petroleum is in the form of distillate and residual fuel oil, used mainly in power plants for electricity generation. The other major categories of petroleum products consumed in 2008 were motor gasoline and other petroleum products. Electricity consumption increased in all CARICOM Member States over the period 1998 – 2007, except in Haiti where it remained relatively constant.

Energy poverty is not a major concern in the Caribbean where upwards of 90 per cent of citizens have access to electricity in most CARICOM countries. Those communities that lack access can benefit from distributed generation which RE systems can provide more efficiently.

The contribution of renewable energy (RE) in CARICOM is small compared to the vast potential available. Renewable energy contributed about 9 per cent to the total primary energy consumed between 1998 and 2007. However there has been a gradual decline over the subsequent years as the share of renewable energies for electricity generation has declined.

The Caribbean region has significant potential for RE development with solar, wind, geothermal and hydro power being the best options. Belize, Jamaica and Suriname recorded significant increases in renewable energy electricity mainly from hydropower. Wind-powered electricity generation occurs in Jamaica and St. Kitts and Nevis and there is biomass-based energy notably in Belize, Guyana and Suriname. Electricity consumption for heating water in Barbados decreased due to increased penetration in the utilization of solar heating.

Challenges in the Caribbean Energy Sector

Dependence on imported fossil fuels within CARICOM has created significant macro-economic challenges for the fuel importing countries. The value of energy imports compared to total imports in the importing Member States have progressively increased over the years, producing a negative impact on macroeconomic sustainability. Petroleum derivate imports account for between 40 per cent and 60 per cent of total export earnings for countries such as Jamaica and Guyana with a larger industrial base. For the tourism / service oriented Member States such as Belize, Grenada, St. Vincent and the Grenadines and Barbados, petroleum imports range from 13 per cent to 30 per cent of export earnings (CARICOM, 2013).

The electricity generation infrastructure in many Caribbean countries is old and inefficient. System losses range from a low of 6.6 per cent in Barbados (in 2009) to a high of approximately 50 per cent in Haiti. Essentially, these losses signify important resources that are being wasted and serving no useful economic or development purpose.

Opportunities in the Caribbean Energy Sector

The CARICOM Energy Policy, approved in 2013, demonstrates a regional commitment to creating an energy sector that will facilitate the transition toward a green economy. The policy's goal is to access to affordable, adequate, safe and clean energy products

The Goal/Vision of the CARICOM Energy Policy

“Fundamental transformation of the energy sectors of the Member States of the Community through the provision of secure and sustainable supplies of energy in a manner which minimizes energy waste in all sector, to ensure that all CARICOM citizens have access to modern, clean and reliable energy supplies at affordable and stable prices, and to facilitate the growth of internationally competitive Regional industries towards achieving sustainable development of the Community.”

necessary for the sustainable development of Member States and presents a set of objectives that addresses all the principal “sustainable energy” issues.

CARICOM Energy Policy Objectives

1. Sustainable and secure energy supplies through diversification of energy sources
2. Accelerated deployment of renewable and clean sources of energy supplies towards increased energy supply diversification and affordability
3. Sustained growth of intra-Community trade in energy
4. Increased energy efficiency and conservation in all sectors, including the transportation sub-sector
5. Establishment and enforcement of labeling and standards for the importation of electrical appliances as well as standards for vehicles importation
6. Increased investment in production, transformation and distribution of viable energy resources
7. Strengthening and enhancement of the human and institutional capacities in the Community energy sector
8. Programmed expansion of electricity generation, transmission, distribution and trade
9. Improved access to affordable energy by the poor and vulnerable
10. Greater use of renewable energy for electricity generation as well as in the transportation, industrial and agricultural sectors
11. Coordinated approach to exploring and establishing an institutional framework for leveraging financing mechanisms for the development of viable energy resources
12. Increased technology transfer and information sharing
13. Established regional and national targets for emissions reduction with corresponding mitigation actions
14. Strategies for maintenance of adequate energy reserves in the event of disasters

15. Strengthened research, development and innovation efforts in energy sector especially in areas of clean and renewable energy sources and technologies

Other regional programmes provide a supporting environment for transformation of the Caribbean energy sector.

- **Energy and Climate Partnership of the Americas** – fosters partnerships across the Americas to achieve low carbon economic growth and development through initiatives that address energy efficiency, renewable energy, cleaner and more efficient use of fossil fuel, energy infrastructure, energy poverty, sustainable forests and land use and adaptation.
- **SIDS DOCK** – a collective institutional assistance mechanism for sustainable economic development of SIDS and help generate financial resources for addressing climate change adaptation; developed jointly by the Caribbean Community Climate Change Centre and the Secretariat of the Pacific Regional Environment Programme for AOSIS and CARICOM Member Countries⁹. Public-private partnerships will be promoted as a means for investments in sustainable energy projects and technology transfers.
- The **Caribbean Sustainable Energy Roadmap and Strategy (C-SERMS)** – a sustainable energy planning, management and implementation framework and communication tool developed under the CARICOM Energy Programme in collaboration with CARICOM member states and other partners. C-SERMS has recommended regional targets for renewable power capacity, energy efficiency, and carbon emissions reductions in the short (2017), medium (2022), and long term (2027), and outlines key strategies for achieving those targets (CARICOM, 2013b).

At the national level, all 15 CARICOM member states have adopted a national energy policy or have a document in advanced stages of development. National policymakers across the region have set domestic targets to promote renewable energy use. Many member states have already taken the lead in developing and implementing domestic policy mechanisms to support an increase in renewable energy and energy efficiency.

At the regional level, policymakers have jointly established net-billing as the appropriate minimum standard for policy support across CARICOM. Despite these important initial steps, sustainable energy development across the region continues to be limited by policy and data gaps, administrative ineffectiveness, and often inefficient and uncoordinated implementation efforts.

⁹ As at October 2011, the eight (8) CARICOM Member States participating in SIDS DOCK are: Antigua and Barbuda, the Bahamas, Belize, Dominica, Grenada, Jamaica, Saint Lucia and Suriname. Barbados and St. Vincent and the Grenadines have committed to signing.

Challenges and Opportunities for Renewable Energy in the Caribbean

Challenges for Renewable Energy in the Caribbean

There are a number of challenges to adoption of renewable energy which have led to a relatively slow uptake of RE technology in the Caribbean. These barriers include the following:

- absence of legislation, regulatory institutions and instruments
- lack of consistent and coherent policies
- inadequate financing/high levels of public sector indebtedness
- high initial capital costs
- inadequate access to land
- technical limitations (for example, 30 per cent generation limits), related to grid absorption capacity
- economy of scale limitations
- high transaction costs
- limited R&D resources
- inadequate availability of skills

International Energy Agency Definition of Renewable Energy

Renewable energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly or indirectly from the sun, or from heat generated deep within the earth. Included in the definition is energy generated from solar, wind, biomass, geothermal, hydropower and ocean resources, and biofuels and hydrogen derived from renewable resources.

Note that renewable energy technologies are not without negative impacts and careful planning to address possible environmental and social impacts are essential. Potential issues include the following:

- Production of biofuels can have negative impacts on biodiversity and ecosystems, due to land-use changes and agricultural production practices. This has led to the development of biofuel sustainability standards.
- The environmental and social impacts of large-scale hydropower are significant. The World Commission on Dams has provided guidelines for reducing possible negative impacts of hydropower development. However, in many cases, only small-scale or low-impact hydro solutions are considered to be sustainable energy solutions.
- Increased mining activity and deforestation could result from increased use of renewable energy sources requiring rare earth elements.

Opportunities for Renewable Energy in the Caribbean

Many opportunities exist for the development of renewable energy in the Caribbean.

Recent trends in renewable energy investment

During the past 10 years the growth of investment in renewable energy has been rapid. From 2004 to 2010, total investments into renewable energy exhibited a compound annual growth rate of 36 per cent due to the following reasons:

- The relatively easy access to capital for project developers and technology manufacturers in the developed world and major emerging economies and low interest rates supported the growth of renewable energy technologies
- For some renewable energy technologies, technological developments have led to a significant decline in costs and increased reliability of the technology, which have made investments more attractive
- High oil prices contributed to the interest in renewable energy investments
- Regulatory support for renewable energy technologies increased over the past 10 years

Technical advances and cost competitiveness

As renewable energy technologies have matured their costs have reduced, making many of them increasingly competitive with other energy technologies. Table 2 shows the relative maturity of RE technologies which can be correlated with the cost for implementing this technology.

Table 2: State of Maturity of Renewable Energy Technologies

RE Technology	State of Maturity
Hydropower	The most mature technology
Sustainable biomass applications	Production of sugarcane bioethanol-based transport fuels in Brazil is a commercially mature technology
Wind	Onshore applications of wind energy are also commercially mature, while offshore wind energy is in the diffusion phase and, in some situations, approaching the commercially mature phase
Low temperature solar thermal	Solar energy technologies for heating purposes are commercially mature
Solar photovoltaic (PV)	Solar PV for electricity in small-scale applications is approaching commercial maturity, such as solar rooftop home systems or solar lanterns in off-grid areas, but is generally still dependent on subsidies or price support mechanisms
Geothermal energy	Geothermal energy is harnessed for heat and power generation. It is mature in many countries.

Enabling Conditions for Renewable Energy in a Green Economy

The further development of renewable energy will require a supportive policy environment and enabling conditions that will help level the playing field between fossil fuels and renewable energy sources.

Policy commitment to renewable energy

An enabling policy framework for renewable energy includes clear commitments to long-term development of the sector. Such commitment can be manifested by targets for investment in additional capacity and penetration rates within the energy mix. When supported by other enabling policies, setting targets to achieve these goals can send a strong signal to potential investors. As noted above, all 15 CARICOM countries have national energy policies or are on their way to doing so. The challenge is to ensure policy coherence so that other policies, for example for transportation and tourism, complement these energy policies.

Mitigating risks and increasing returns

As is the case in other sectors, the nature of risks, relative to expected returns, influences the incentive to invest in renewable energy. Risks include:

- Technical and project-specific risks, including risks associated with lead times, construction costs, novelty of the technology, fuel and resources, and operations and management
- Country-specific institutional risks such as stability of the government, reliability of the legal system, transparency of business dealings, currency risks
- Political risk and regulatory risks, such as unexpected changes in policy or uncertainty about the future direction of policy
- Business and market risks, including: financial risks relating to the capital structure of the project such as high upfront capital intensity and the project's ability to generate enough cash flow; economic risks relating to interest rates, exchange rates, inflation, commodity prices, counterparty credit risk; and market risks associated with, for example, future electricity and carbon prices

Various government initiatives, including regulatory policies, fiscal incentives and public financing mechanisms, can reduce many of these risks and thus increase expected returns.

Such measures include:

- offering long-term policy commitment to increased deployment of renewable energy investment
- government-sponsored initiatives to share risks, for example, through loan guarantees or public participation in the project or related infrastructure investments
- action to improve permitting procedures, or grid connection procedures in the case of power generation projects

Module 2 discussed other government initiatives that can provide an enabling environment for movement toward a green economy. These can be applied to the RE sector.

Electricity infrastructure and regulations

The increased use of renewable energy in power generation faces specific barriers due to the demands it makes on existing electricity infrastructure. Electricity generation by wind and solar PV adds variability and lower predictability to the power system, requiring more attention to the design and regulation of energy systems and markets. More reserve capacity, storage or increased trade between countries in the region is needed to provide the necessary flexibility to match demand with variability in supply. Smart grids with variable cost pricing and micro-metering can provide increased demand flexibility and enhance energy efficiency.

Government authorities have to be alert to signals from the renewable energy sector and address market entry barriers that may stem from incumbent industries. In some situations, vested interests and control of access to the grid by incumbent power companies can pose barriers for independent providers of power from renewable sources. Similarly, oil companies may impede the distribution of biofuels through networks that they control. The construction sector may be reluctant to integrate renewable cooling technology in their practices and building codes.

Sustainability standards

As discussed above, renewable energy is not synonymous with sustainability and certain renewable technologies can have significant negative impacts. Governments must establish and follow renewable energy technology standards that protect environmental and social goals. Any standards should balance stringency and flexibility. Overly rigid standards would be a disincentive for producers to enter the market and may limit investment.

Agriculture



Agricultural development is considered as an essential element of the green economy. It has been acknowledged that the development of the agriculture sector using the principles of a green economy will contribute to improved nutrition and health, enhanced food security, reduced dependence on food imports, creation of rural jobs, reduced pressure on the environment – including reductions in GHG emissions – and overall economic and social welfare.

Agriculture also has tremendous potential to alleviate poverty. On average, the contribution of agriculture to raising the incomes of the poorest is estimated to be at least 2.5 times higher than that of non-agriculture sectors in developing countries.

Defining Green Agriculture

The greening of agriculture refers to the increasing use of farming practices and technologies that simultaneously:

- maintain and increase farm productivity and profitability while ensuring the provision of food and ecosystem services on a sustainable basis
- reduce negative externalities and gradually lead to positive ones
- rebuild ecological resources (i.e. soil, water, air and biodiversity natural capital assets) by reducing pollution and using resources more efficiently

Farming practices and technologies that are instrumental in greening agriculture include:

- restoring and enhancing soil fertility through the increased use of naturally and sustainably produced nutrient inputs; diversified crop rotations; and livestock and crop integration

- reducing soil erosion and improving the efficiency of water use by applying minimum tillage and cover crop cultivation techniques
- reducing chemical pesticide and herbicide use by implementing integrated and other environmental friendly biological pest and weed management practices
- reducing food spoilage and loss by expanding the use of post-harvest storage and processing facilities.

The greening of agriculture does not rule out technologies or practices on ideological grounds. If a technology works to improve productivity for farmers, and does not cause undue harm to society and the environment, then it is acceptable. Although natural methods of pest and weed management and organic sources of fertilizer and seed are at one end of a green agriculture spectrum, the highly efficient and precise use of inorganic fertilizers, pest controls and technological solutions may also be included in the broad spectrum of sustainable farming practices.

Overview of the Agriculture Sector in the Caribbean

Agriculture is an important sector in most CARICOM countries despite the economic diversification which has taken place over the last four decades, with the growth of service industries, notably tourism and financial services.

The agriculture sector contributed an average of 3.6 per cent gross domestic product (GDP) in 2006 across CARICOM countries – ranging from a high of 29.6 per cent in Guyana and 17.2 per cent in Dominica to a low of 1.3 per cent in Montserrat and 0.4 per cent in Trinidad and Tobago (see Table 3) (CARICOM, 2006).

The sector's economic contribution to GDP is enhanced when the GDP of agro-industries is included. For example, in Trinidad and Tobago, the percentage GDP share of primary agriculture plus agro-food industries was approximately 8 per cent compared with only 0.4 per cent for primary agriculture alone.

Although agriculture cannot be regarded as a predominant sector on the basis of its GDP contribution, it is a significant absorber of the total employed labour force in the Caribbean: 3.3 million agricultural workers or 32 per cent for 15 countries including Haiti, or 1.1 million agricultural workers or 17 per cent of the employed labour force if Haiti is excluded (CARICOM, 2008). Furthermore, the agriculture sector makes an important contribution to rural development in the region.

Table 3: Contribution of Agriculture to GDP (2000 constant prices)

Country	% GDP
Antigua & Barbuda	3.0
The Bahamas	2.0
Barbados	3.0
Belize	12.0
Dominica	17.2
Grenada	5.6
Guyana	29.6
Jamaica	5.7
Montserrat	1.3
St. Kitts & Nevis	2.2
Saint Lucia	3.3
St. Vincent & the Grenadines	8.2
Suriname	9.9
Trinidad & Tobago	0.4

Source: CARICOM Secretariat, 2006

Traditionally, agricultural commodities such as bananas, sugar, rice, cigars and citrus have been among the main exports. Agricultural exports exceeded 60 per cent of total merchandise exports in the 2001-2003 period in Belize, the Dominican Republic, Saint Lucia and St. Vincent and the Grenadines. The agricultural export proportion was between 20 per cent and 40 per cent in Barbados, Dominica, Grenada and Jamaica. Only in Antigua and Barbuda and in the Bahamas were agricultural exports less than 5 per cent of total merchandise exports.

The overwhelming majority of farms in the Caribbean (84 per cent average for the Caribbean) are small farms (defined as less than 4 hectares) (CARICOM, 2008). Small farms are too small to realize the economies of scale required for increased farming efficiency and small farmers often have to deal with issues such as high cost of purchased inputs (for example, chemical fertilizers, pesticides and seeds), insecure land tenure, inability to secure loans and inadequate road transportation to large urban market centres.

Challenges and Opportunities for Agriculture in a Green Economy

Challenges in the Caribbean Agriculture Sector

The agricultural sector in most Caribbean countries has declined in recent years, primarily because of the contraction in traditional exports. Sugar, bananas, cocoa and rice have experienced price volatility in commodity markets and suffered from the erosion of European Union trade preferences (ILO, 2006). Declining output levels have resulted in declining employment in the sector, negatively affecting rural development.

Challenges in the agriculture sector include:

- Labour shortages, both with regard to unskilled and skilled labour
- Limited access to land due to patterns of land ownership and land tenure
- Competing demands for land by other sectors such as housing and tourism
- Poor land and soil quality due to poor management and utilization of the natural environment
- Outdated and inefficient health and food safety systems
- Inadequate transportation systems, particularly for perishables
- Weak marketing systems, linkages and participation in growth markets
- Limited financing and inadequate new investments
- Weak national statistical systems that affect the collection of agricultural statistics
- Vulnerability to natural hazards such as floods and hurricanes
- Praedial larceny

Opportunities for the Caribbean Agriculture Sector

Many opportunities exist for promoting green agriculture. They include increased awareness by governments, donor interest in supporting agriculture development in low income countries, growing interest of private investors in sustainable agriculture and increasing consumer demand for sustainably produced food.

Government awareness

Governments have become increasingly aware of the need to promote more environmentally sustainable agriculture. Due to new government policies that have emphasized green agriculture, the proportion of global arable land dedicated to organic crops has increased from a negligible amount in 1990 to around 2 per cent in 2010, and as much as 6 per cent in some countries. The extent of soil erosion and the intensity of air pollution have fallen; the amount of land assigned to agriculture has decreased even as production has increased, and there have been improvements in the efficiency of input use (fertilizers, pesticides, energy, and water) since 1990. However, subsidies for farm-fuel have continued to be a disincentive to greater energy efficiency (UNEP, 2011).

The “Jagdeo Initiative” was a key Caribbean effort, led by President Bharrat Jagdeo of Guyana, to develop a framework for repositioning agriculture in the region. The framework identified some of the constraints and challenges in the agriculture sector in the Caribbean and to develop some interventions to address those challenges. This initiative could be used as a vehicle for regional movement to position agriculture within the movement toward a green economy.

Donor support for agriculture development

After a steady decline over that past 30 years, agriculture-related development assistance began to pick up in 2006 as the current food crisis escalated. In 2009, at the G8 summit in Italy, wealthy nations pledged US\$ 20 billion for developing-country agriculture. However, as UN Secretary General Ban Ki-moon says, these investments must, “breathe new life into agriculture, one which permits sustainable yield improvements with minimal environmental damage and contributes to sustainable development goals”.¹⁰

Private funding interest

Preferential access to credit and investment capital is one of the most important incentives to catalyze a transition to greener agriculture. Major financial institutions are expanding their green portfolios to offer investment credit to companies that manufacture and market products that enable more efficient use of agricultural inputs and introduce innovative private enterprises. The public sector should support finance

¹⁰ 14. Ban Ki-moon. (2010). Media coverage of his statement: available at <http://www.un.org/apps/news/story.asp?NewsID=26670> , retrieved on 26 January 2011.

mechanisms (e.g. loan-guarantee funds) that can leverage private capital loans to smallholders who need working capital to undertake sustainable agriculture practices.

Increasing consumer demand for sustainable food

Over the last few years, consumer demand for sustainably produced food has increased rapidly. Purchasing patterns of fairtrade products have remained strong despite the global economic downturn. In 2008, global sales of fairtrade products exceeded US\$ 3.5 billion. The major markets for organic food and beverages expanded on average by 10 to 20 per cent per year between 2000. This demand has driven a similar increase in organically managed farmland.

A number of Caribbean countries have embarked on a process of organic production of traditional export crops such as sugar, bananas, coffee and cocoa. Most of the certified organic farms in the region are found in Cuba and the Dominican Republic and to a lesser extent in Guyana and Jamaica (ECLAC, 2004). Organic production is better oriented towards export markets where premium prices can be obtained. Although domestic food production can be carried out using organic methods the price of food would increase thus making such production unprofitable on account of a relatively small target market. However, organic food production could be undertaken for the tourist market.

The Benefits of Greening Agriculture

The greening of the agriculture sector is expected to generate a range of benefits including increased profits and income for farmers, gains at the macroeconomic level, enabling the sector to adapt to climate change and benefits for ecosystem services.

Profitability and productivity of green agriculture

Many studies have documented the profitability and productivity of sustainable farms, both in developed and developing countries. One study showed an average yield-increase of nearly 80 per cent as a result of farmers in 57 poor countries adopting 286 recent best practice initiatives, including integrated pest and nutrient management, conservation tillage, agroforestry, aquaculture, water harvesting and livestock integration. All crops showed water use efficiency gains, with the highest improvement occurring in rain-fed crops. Carbon sequestration potential averaged 0.35tC/ha/year. Of projects with pesticide data, 77 resulted in a decline in pesticide use by 71 per cent, while yields grew by 42 per cent.

A significant part of a farm's production costs is linked to its energy inputs and organic agriculture tends to be more energy-efficient. Growing organic rice can, for example, be four times more energy-efficient than the conventional method (Mendoza 2002). Another study found that organic agriculture reduces production systems' energy requirements by 25 to 50 per cent compared with conventional chemical-based agriculture.

The other approach to restructuring is not to switch to organic production but to improve efficiency within the traditional industry and alter the marketing strategy. Both Guyana and Jamaica, the largest sugar producers in the CARICOM region, have been pursuing improvement in efficiency in the sugar industry. Guyana embarked on the construction of a new state-of-the-art sugar factory to expand production and reduce cost. The factory included a power co-generation element, to facilitate reduction in the cost of production by at least 50 per cent. Guyana expects that the modernization of sugar production through the use of high technology in processing will allow it to successfully compete in the European market as well as supply the Caribbean market with all its sugar requirements (ECLAC, 2006).

Macroeconomic benefits from greening agriculture

Significant secondary macro-economic and poverty reduction benefits are expected from greening agriculture. Investments aimed at increasing the productivity of the agriculture sector have proved to be more than twice as effective in reducing rural poverty than investment in any other sector (UNEP, 2011). In addition, green agriculture directs a greater share of total farming input expenditures towards the purchase of locally-sourced inputs (e.g. labour and organic fertilizers) resulting in a local multiplier effect. Overall, green farming practices tend to require more labour inputs than conventional farming (e.g. up to as much as 30 per cent more), creating jobs in rural areas.

Greening agriculture can relax foreign-exchange constraints by reducing the need for imported inputs and by increasing exports of sustainable agrifood products thus enabling countries in the region to purchase technology and other critical inputs for their economies.

Climate adaptation and mitigation benefits, and ecosystem services

Making agriculture more resilient to drought, heavy rainfall events, and temperature changes is closely linked to building greater farm biodiversity and improved soil organic matter. Practices that enhance biodiversity allow farms to use natural ecological processes to better respond to change and reduce risk. The use of species diversity serves as an insurance against future environmental changes by increasing the system's adaptive capabilities. Improved soil organic matter from the use of green manures, mulching, and recycling of crop residues and animal manure increases the water holding capacity of soils and their ability to absorb water during torrential rains.

The environmental services provided by greening farms are critical and far-reaching. Conversion to organic agriculture can increase carbon sequestration substantially. Also, emissions of nitrous oxides and methane could be reduced if farmers use nitrogen and other fertilizers more efficiently, including through precision applications and introducing improved crop varieties that more effectively access and use available nitrogen in the soil. Additional ecosystem benefits resulting from greening of agriculture

include better soil quality with more organic matter, increased water supply, better nutrient recycling, wildlife and storm protection and flood control.

Enabling Conditions for Agriculture in a Green Economy

The transition to green agriculture will require a supportive policy environment and enabling conditions that could help level the playing field between conventional and green agricultural practices.

There needs to be a greater use of regulations and taxes that impose penalties for pollution in order to include externality costs into market prices for these inputs, as well as economic incentives that reward green practices. There are also opportunities for applying market solutions as alternatives to direct regulation. In general, governmental subsidies for farmer (producer) support should be increasingly decoupled from crop production and alternatively be retargeted to encourage farmers' efforts and investments in adopting green agriculture practices.

Caribbean countries should advocate for changes in global trade and subsidy policies to liberalize trade in environmentally- friendly products and services while allowing them to protect some domestic food crops (special products) from international competition when they are particularly important to food security and rural livelihoods. The World Trade Organization already makes a dispensation for countries with a per capita GDP of less US\$ 1,000. Furthermore, agricultural subsidies need to be redirected to encourage more diverse crop production with long-term soil health and improved environmental impacts. A major shift of subsidy priorities is needed in which governments would help reduce the initial costs and risks of farmers' transition efforts to implement sustainable farming practices.

National Policies

At the domestic public policy level, the key challenge is creating the conditions that would encourage more farmers to adopt environmentally sound agriculture practices instead of continuing to practice unsustainable conventional farming methods.

Support for improved land tenure rights of smallholder farmers

In order for farmers to invest capital and more labour into the transition to green agriculture, major land reforms will have to be implemented. In the absence of more secure rights to specific plots of land for many years into the future, many poor farmers are unlikely to take on additional risks and efforts to gradually build up the natural capital of their farms beyond a one or two-year horizon.

Public procurement of sustainably produced food

Government-sponsored food programmes for schools and public institutions and public procurement policies should be encouraged to source foods that are sustainably produced.

CASE STUDY

The Strategic Paper on Public Procurement, prepared by the UK Department for Environment, Food and Rural Affairs in 2008, provides a good example of how organic and sustainable products can be supported through public procurement policies.¹¹

It advocates:

- Setting targets for more organic produce in public procurement
- Including appropriate clauses in tender documents (and provides examples)
- Creating better links between relevant government departments (e.g. Ministries of Agriculture and Health)
- Training procurement staff

Tourism-agriculture linkages could be strengthened and stressed in national tourism plans. Specific suggestions are for the development of community-based tourism products such as eco-tourism, rural-tourism, and agro-tourism.

Fiscal and Economic Incentives

Taxes on non-beneficial practices

Agriculture's environmentally damaging externalities could be reduced by imposing taxes on fossil fuel inputs and pesticide and herbicide use; and establishing specific penalties for air emissions and water pollution caused by harmful farming practices.

Tax exemptions for beneficial practices

Alternatively, tax exemptions for investments in integrated pest management products; and incentives that value the multi-functional uses of agricultural land have proven effective in improving the after tax revenues for farmers that practice sustainable land management. The OECD countries have developed a wide range of policy measures to address environmental issues in agriculture, which include economic instruments (payments, taxes and charges, market creation, e.g., tradable permits), community based measures, regulatory measures, and advisory and institutional measures (research and development, technical assistance and environmental labelling).

A number of Caribbean countries have removed taxes and duties on energy efficient products and renewable energy products such as fluorescent lights and solar water heaters.

A shift away from production-linked support can enable the agricultural sector to be more responsive to markets, thus improving growth. Further, societal and environmental benefits can be achieved by linking support measures to specific environmental objectives, research and development, information, and technical

¹¹ The paper is available at <http://www.sustainweb.org/pdf2/org-238.pdf>.

assistance, food inspection services, biodiversity, flood and drought control, and sinks for greenhouse gases and carbon storage.

Payment for Ecosystem Services

Payment for Ecosystem Services (PES) can further incentivise efforts to green the agriculture sector. PES verifies values and rewards the benefits of ecosystem services provided by green agricultural practices. A key objective of PES schemes is to generate stable revenue flows that help compensate farmers for their efforts and opportunity costs incurred in reducing environmental pollution and disruption of ecosystem services. Such PES arrangements should be structured so that small-scale farmers and communities, not just large landowners, are able to benefit. The use of PES schemes should be limited to those instances where appropriate safeguards have been put in place to avoid abuse.

Innovative PES measures could include the following:

- reforestation payments made by cities to upstream communities in rural areas of shared watersheds for improved quantities and quality of fresh water for municipal users
- ecoservice payments by farmers to upstream forest stewards for properly managing the flow of soil nutrients and surface waters
- methods to monetize the carbon sequestration and emission reduction credit benefits of green agriculture practices in order to compensate farmers for employing these practices

Finance programmes for smallholder farmers

Improving small farmers' access to working capital through microfinance is an option that would allow much greater numbers of small-scale producers to procure green inputs and related mechanization technologies.

Also, weather-indexed crop insurance could be made available for small farmers. The agriculture sector in general and small farmers in particular can be severely impacted by hurricanes and rainfall. This type of insurance is already available in certain Caribbean countries – as described in the box below.

CASE STUDY

Small farmers in Jamaica, Saint Lucia and Grenada are able to purchase “Livelihood Protection Policies” (LPPs) which provide insurance coverage against extreme weather events. Developed through the Climate Risk Adaptation and Insurance in the Caribbean Project led by the Munich Climate Insurance Initiative (MCII) in collaboration with CCRIF, MicroEnsure and Munich Re, the LPP provides quick cash payouts to policy holders if high winds and heavy rainfall trigger their policies

A second product, the Loan Protection Cover has been developed under the project, which is a loan portfolio hedge for lending institutions that effectively “insures” loan portfolios against climate risk so that these institutions can make loans to persons previously considered too risky for traditional lending.

Capacity Building and Awareness-Raising

The availability and qualitative capabilities of rural farmers are critical resources needed for implementing green agriculture practices. Green agricultural practices emphasize crop and livestock diversification; local production of natural fertilizer and other more labour intensive farm operations. The seasonal variability of crop-specific farming tasks affects temporal labour surpluses and shortages, which must be managed throughout the year.

Supply chains, extension services and NGOs

Green farming practices must be promoted and supported by information outreach and training programmes that are delivered to farmers and their supply-chain partners. These enhanced and expanded training programmes should build upon established agriculture extension service programmes where they exist (for example the Rural Agricultural Development Authority (RADA) in Jamaica). The green agriculture paradigm requires participatory learning in which farmers and professionals in agro-ecological sciences work together to determine how to best integrate traditional practices and new agro-ecological scientific discoveries.

Surveys among farmers' organizations across the region reveal that the average age of farmers has been increasing to 45 years old in most islands with the majority being over 60 years old (CaFAN, 2006). It has been found that small-scale farmers are not the easiest of groups to embrace innovation within their occupation especially among the older farmers who constitute an increasing percentage of the farmer population. This is often attributed to their many years of farming along with the wealth of local/indigenous knowledge they have among themselves. As such, it is essential for policy makers to include local knowledge to aid the development of new coping mechanisms for small-scale farmers.

Efforts should also be made to partner with NGOs that support farmers, agriculture colleges, demonstration farms and other such initiatives. It is also important to support small and medium business enterprises that are involved in supplying agriculture inputs; particularly those firms that offer green agriculture products and services such as organic certification auditing and reporting.

Institutionalization of green agriculture training

There are opportunities for increased training and building networks of professionals. Areas for training include the drafting of legislation for food safety, inspection and laboratory techniques. This should be supported by standardization of curricula in educational institutions to include concepts and practices of green agriculture.

Integrating information and communications technologies with knowledge extension

Support is needed to improve farmers' access to market information – using information technology and other avenues – in order to enhance their knowledge of real market prices so that they can better negotiate the sale of their crops to distributors and end customers.

There are also opportunities to support the construction of meteorological monitoring telemetry stations that could support national and regional weather forecasting capabilities that would help farmers determine best times for planting, fertilizer applications, harvesting and other critical weather-sensitive activities. Such networks could help support the introduction of innovative financial services such as weather-indexed crop insurance that would help reduce risks associated with adopting new technologies and shifting to green practices and marketing methods.

Data collection and dissemination

Caribbean countries need to improve statistical systems and increase research and development activities. Countries should undertake regular agricultural censuses and produce up-to-date agricultural statistics to facilitate research in areas such as the dynamics of the agricultural labour market, productivity of resource use, and the scope for new agricultural crops and processed commodities. National data collection systems could be supported by regional initiatives for monitoring and inspection that facilitate the achievement of common regional standards.

Better food choices

In an era where global human health is undermined by malnourishment and obesity, there is an opportunity to guide and influence people's food consumption into a greater balance with sustainably produced and more nutritious foods. Raising awareness about better food and its availability at affordable prices can reduce and reshape food demand trends. In this regard, there is a need to invest in public education and marketing that would encourage consumers to adopt more sustainable dietary habits (OECD 2008).



Tourism is one of the world's largest business sectors, growing by 90 per cent from 1995 to 2010. It is responsible for over 250 million jobs or more than 8 per cent of total employment and accounts for over 9 per cent of the world's GDP (UNEP, UNDESA and FAO, 2012). Tourism is a vital sector of the economies of most small island developing states (SIDS) including those in the Caribbean. For more than half of the SIDS, it is their largest source of foreign exchange.

Defining Sustainable Tourism

Sustainable tourism is not a special form of tourism – it is not ecotourism – but it refers to all forms of tourism being sustainable. It requires a shift across the entire industry pertaining to the implementation of policies, practices and programmes that embrace sustainability, focusing on:

- conservation of natural resources, maintaining the resource base and protecting biodiversity and ecosystems
- the use of renewable sources of energy and increased energy efficiency – being more climate neutral
- reduction of water consumption
- waste minimization
- maintenance of culture, traditions and heritage and the promotion of cultural tolerance and respect
- generation of income for local communities
- the alleviation of poverty in communities

Thus, sustainable tourism takes into account the expectations of tourists regarding responsible natural-resource management (demand), and also the needs of communities that support or are affected by tourism projects and the environment (supply). Making tourism businesses more sustainable benefits local communities and raises awareness and support for the sustainable use of natural resources.

The Global Sustainable Tourism Criteria (GSTC), are an international consensus on the minimum criteria that a tourism business should follow to approach sustainability. Focusing on social and environmental responsibility, as well as the positive and negative economic and cultural impacts of tourism, the criteria are organized into four topics: sustainable management, socio-economic impacts, cultural impacts, and environmental impact . Two sets of GSTC Criteria have been developed: for hotels and tour operators, and for destinations.

www.gstcouncil.org/sustainable-tourism-gstc-criteria.html

Overview of the Tourism Sector in the Caribbean

The social, economic and environmental well-being of most Caribbean countries is tied to the tourism sector. Travel & Tourism plays a proportionately stronger role in relative contribution to GDP than any other comparable region. On average, tourism receipts represent almost 18 per cent of the Caribbean's total exports (WTTC, 2014). As well as its direct economic impact, the industry has significant indirect and induced impacts. The total contribution of Travel & Tourism comprises direct, indirect and induced impacts on the economy.

Direct contribution - the 'internal' spending on Travel & Tourism (total spending within a particular country on Travel & Tourism by residents and non-residents for business and leisure purposes) as well as government 'individual' spending - spending by government on Travel & Tourism services directly linked to visitors, such as cultural (eg museums) or recreational (eg national parks)

Indirect contribution - The GDP and jobs supported by:

- Travel & Tourism investment spending – an important aspect of both current and future activity that includes investment activity such as the purchase of new aircraft and construction of new hotels
- Government 'collective' spending, which helps Travel & Tourism activity in many different ways as it is made on behalf of the 'community at large' – eg tourism marketing and promotion, aviation, administration, security services, resort area security services, resort area sanitation services, etc
- Domestic purchases of goods and services by the sectors dealing directly with tourists - including, for example, purchases of food and cleaning services by

hotels, of fuel and catering services by airlines, and IT services by travel agents.

Induced contribution - The GDP and jobs supported by the spending of those who are directly or indirectly employed by the Travel & Tourism industry.

Some key statistics for the Caribbean in 2013 are shown in Table 4 below. However, these average figures conceal a wide disparity between individual economies. The figures are disproportionately impacted by the largest economies (Dominican Republic, Cuba, Puerto Rico) which happen to be relatively less reliant on tourism. A number of the smaller Caribbean economies have direct industry and economy GDP shares in excess of 10 per cent and 30 per cent respectively, with a very similar pattern in terms of employment.

Table 4: Key Caribbean Tourism Statistics – 2013

Statistic	2013 Value	Notes
Direct contribution to GDP	US\$ 15.3 billion 4.4% of GDP	Economic activity generated by industries such as hotels, travel agents, airlines and other passenger transportation services; activities of the restaurant and leisure industries directly supported by tourists
Total contribution to GDP	US\$ 49.0 billion 14.0% of GDP	including wider effects from investment, the supply chain and induced income impacts
Visitor exports	US\$ 26.2 billion – from 20,171,000 visitors 18% of all exports	Foreign visitor spending or international tourism receipts
Direct jobs	607,000 3.6% of total employment	This includes employment by hotels, travel agents, airlines and other passenger transportation services, restaurant and leisure industries
Total jobs	1,909,000 11.3% of total employment	including wider effects from investment, the supply chain and induced income impacts

Source: Travel & Tourism Economic Impact 2014 Caribbean, World Tourism & Travel Council

Challenges and Opportunities for Tourism in a Green Economy

Challenges in the Caribbean Tourism Sector

Even though tourism generates significant income for the region, the majority of this income – perhaps as high as 80 cents in every dollar – "leaks out" of the Caribbean. Furthermore, many of the jobs created are seasonal and very low-paid, while the money generated by internationally funded projects fails to reach locals. For example, only 15 per cent of the Chinese-funded Baha Mar construction project in the Bahamas found its way to local labourers (Kennedy, 2014). Tourism could have a tremendous beneficial impact on local economies, but many hotels source their food and cleaning products from abroad rather than purchasing them from local producers. An Oxfam study found that hotels in Saint Lucia imported more than 70 per cent of their produce every year.

The tourism industry faces a multitude of other significant sustainability-related challenges, including energy and GHG emissions, water consumption; waste management, loss of biological diversity, and effective management of cultural heritage.

Energy and GHG emissions

The tourism sector's growing consumption of energy, especially in travel and accommodation, and its dependence on fossil fuels has important implications for global GHG emissions and climate change as well as for future business growth. Tourism is estimated to create about 5 per cent of total GHG emissions, primarily from tourist transport (75 per cent) and accommodation (21 per cent).

Tourism's increasing energy consumption is due to growth rates in international tourist arrivals and domestic travel, trends to travel further and over shorter periods of time; as well as preference given to energy-intensive transportation (e.g. aircraft and car travel over train and bus). The sustainability and competitiveness of tourism depends in part on energy efficiency (reduction in overall energy use) and a more intensive use of renewable resources.

As noted above, after transport, accommodation is the most energy-intensive component of the tourism industry – through its demand for cooling, lighting, water heating, cooking, cleaning, pools and sometimes the desalination of seawater. A general rule is that the more luxurious the accommodation, the more energy will be used. Given that most Caribbean countries import their energy supplies, investment in greening tourism is vital to reducing additional burdens placed on other sectors.

While Caribbean countries' contribution to global GHG emissions is relatively small, climate change presents one of the most significant challenges to the sector. Rising sea levels have can cause loss of land along coastlines of low-lying islands, disrupting economies and livelihoods. For example, a 50-centimeter rise in sea level will result in Grenada losing 60 per cent of its beaches (SIDS, 2014). Climate change may cause coral

bleaching to become an annual occurrence causing further losses in revenue. Dominica has reported that 50 per cent of its corals are bleached, and coral bleaching in Tobago affected an average of 66 per cent of its hard corals in 2005 alone.

Water consumption

While water use by tourism, on a global basis, is far less important than agriculture, industry, or urban domestic use, in some countries and regions, tourism can be the main factor in water consumption. In such areas, it can increase pressure on already diminished water resources and compete with other sectors as well as subsistence needs of local populations. Tourism can also directly affect water quality, for example, through the discharge of untreated sewage or freshwater abstraction.

Direct water use in tourism varies between 100 and 2,100 litres per guest night, with a tendency for larger, resort-style hotels to use significantly more water than smaller establishments or campsites. The main water-consuming factors are golf courses, irrigated gardens, swimming pools, spas, wellness facilities and guest rooms. In Europe, one study states that each tourist consumes 300 litres of freshwater per day on average, whereas luxury tourists can consume up to 880 litres. By comparison, average per capita residential consumption in Europe is estimated at 241 litres per day (UNEP, 2011).

The impact is even more pronounced in Caribbean countries and other SIDS. In many of these countries potable water is scarce, caused by either a physical absence of freshwater or because the necessary infrastructure or resources are lacking. The tourist industry can create situations of stark water inequity between tourists and neighbouring communities. Tourism's water demands can lead to the appropriation of supply to the detriment of local domestic and agricultural needs, caused by the overexploitation of aquifers and reservoirs and the lowering of groundwater tables.

CASE STUDY

Golf tourism is rapidly expanding. An estimated 9.5 billion litres of water are used to irrigate the world's golf courses per day, equivalent to the daily needs of 80 per cent of the global population. One Mediterranean island, where water is so scarce it must sometimes be shipped in, is planning to increase its golf courses from three to 17, with tourism cited as the principal driver. This will involve building over agricultural land and constructing several desalination plants to ensure continual supply (Tourism Concern 2009).

Waste management

Waste management is another increasing and well-recognised challenge in the industry. Waste is generated not only from hotels and other tourism facilities but also from cruise ships sailing through the Caribbean which dump waste into the sea. One 2002 study found that a ship carrying 2,000 passengers and 1,000 crew generated the same amount

of waste as a small city (Kennedy, 2014). This waste, including oil residues, harms marine ecosystems, including coral reefs.

Impacts are also considerable for wastewater management, even in high-income countries. In the Caribbean, hotels often discharge untreated sewage directly into the sea. In general, 60 per cent of water used in tourism results in sewage in need of disposal (UNEP, 2011).

Loss of biological diversity

Large-scale tourism developments have had detrimental effects on biodiversity, including coral reefs, coastal wetlands, rainforests, and mountainous areas. Coral ecosystems have suffered strong adverse impacts from the use of coral for construction materials for hotels, over-fishing off reefs to feed tourists, sewage dumping and sedimentation from improperly managed runoff from buildings, parking lots, and golf courses. Coastal wetlands, particularly mangroves, have routinely been damaged or destroyed to build beach resorts.

Failure to incorporate biodiversity concerns in destination planning and investment will have detrimental effects on the natural environment, increase conflict with local communities, and lead to reduced value-creation potential for both the destination and investors (especially given the increasing interest around the world in nature-based tourism, which represents a strategic argument for maintaining biodiversity in Caribbean tourist destinations).

Management of cultural heritage

Interest in unique cultures by tourists can result in adverse impacts and severe disruption for communities. There are examples of communities overrun by large numbers of visitors, commercialization of traditions and threats to cultural survival from unplanned and unmanaged tourism. Frequently, the cultural issues overlap and are aggravated by environmental issues such as access to water and coastal resources.

Opportunities for the Caribbean Tourism Sector in a Green Economy

There are a number of trends and developments that provide promising opportunities for greening tourism.

Sizing and growth of the tourism sector

Tourism is one of the most promising drivers of growth for the world economy. The sheer size and reach of the sector makes it critically important from a resource perspective. Even small changes toward greening can have important impacts. Furthermore, the sector's connection to numerous sectors at destination and international levels means that changes in practices can stimulate changes in many different public and private actors. The tourism economy represents 5 per cent of global GDP, while it contributes to about 8 per cent of total employment.

Tourist arrivals have shown continuous yearly growth over the last six decades, with an average 4 per cent annual increase during 2009 and 2010 and is expected to continue to grow – despite occasional disruptions due to international crises. Proportionately, tourism will grow faster in less developed countries than in developed economies in the next ten years. Recent trends and forecasts point to a spreading of tourism to new destinations, largely in developing countries, where there is outstanding potential to support development goals, and where new environmental and cultural attributes can make an important contribution to more sustainable tourism destinations (UNEP, 2011).

Changing consumer patterns

Tourist choices are increasingly influenced by sustainability considerations. It has been found that a majority of international tourists are interested in the social, cultural and environmental issues relevant to the destinations they visit and are interested in patronizing hotels that are committed to protecting the local environment. In 2007 TripAdvisor surveyed travellers worldwide and 38 per cent said that environmentally-friendly tourism was a consideration when travelling, 38 per cent had stayed at an environmentally-friendly hotel and 9 per cent specifically sought such hotels, while 34 per cent were willing to pay more to stay in environmentally-friendly hotels (Pollock 2007).

Increasingly, tourists view local environmental and social stewardship as a responsibility of the businesses they support. Research also indicates that consumers are concerned about the local environments of their travel destinations and are willing to spend more on their holidays if they are assured that workers in the sector are guaranteed ethical labour conditions in the places they are visiting (UNEP, 2011). While this trend toward tourists supporting sustainable tourism is increasing, there is some contrary data. One study indicated that less than a third of American travellers indicate a willingness to pay some sort of premium for green travel, higher prices (cost premium) being seen as a demand barrier for the majority of respondents.

Traditional mass tourism such as “sun-and-sand” resorts has reached a steady growth stage. In contrast, ecotourism, nature, heritage, cultural and soft adventure tourism, as well as sub-sectors such as rural and community tourism are taking the lead in tourism markets and are predicted to grow most rapidly over the next two decades. It is estimated that global spending on ecotourism is increasing at a higher rate than the industry-wide average growth.

Potential for local development and poverty reduction

Making tourism more sustainable can create stronger linkages with the local economy, increasing local development potential. Of particular importance are:

- purchasing directly from local businesses
- recruiting and training local unskilled and semi-skilled staff
- entering into neighbourhood partnerships to make the local social environment a better place to live, work and visit

- ability to improve the local natural environment

Benefits of Tourism in a Green Economy

Tourism drives significant investments. Adding even small percentages of investment for a greener tourism sector results in very significant increases in investment flows. A tourism product is a combination of different activities and inputs produced by many sectors: enhanced spending by tourists can benefit agriculture, handicrafts, transport, water and waste management, energy efficiency and other services. Importantly, increased investment could have greater impact on green outcomes. As tourism development at destinations requires investment in facilities such as roads, water supply, and energy, it improves the basic common infrastructure facilities required for development of other sectors and improvement of quality of life

Benefits in employment

Tourism is human-resource intensive due to the service nature of the industry. It allows for quick entry into the workforce for youth and women. Sustainable tourism investment can help create job opportunities, especially for poorer segments of the population. Additional employment in energy, water, and waste services and expanded local hiring and sourcing are expected from the greening of mainstream tourism segments. This also is likely to significantly expand indirect employment growth opportunities from segments oriented toward local culture and the natural environment.

CASE STUDY

It is estimated that sustainable tourism in Nicaragua, a destination that focuses very prominently on its culture and natural environment, has an employment multiplier of 2. That is, for every job in the tourism sector, additional local employment is created, with higher wages than the national averages (Rainforest Alliance 2009).

Local economic development and poverty reduction

In destinations where a large percentage of tourist needs are locally supplied (beds and linens, food and beverage, equipment and supplies, labour, tour and transportation services, souvenirs, among others), local contribution and multipliers tend to be high, and the resulting economic impact correspondingly greater. More sustainable tourism can increase both the local contribution and multiplier effect as local communities are involved in the tourism industry, through the supply of products, labour, tourism services and, increasingly, green services. Figure 3 shows an example of local community benefits in Malaysia.

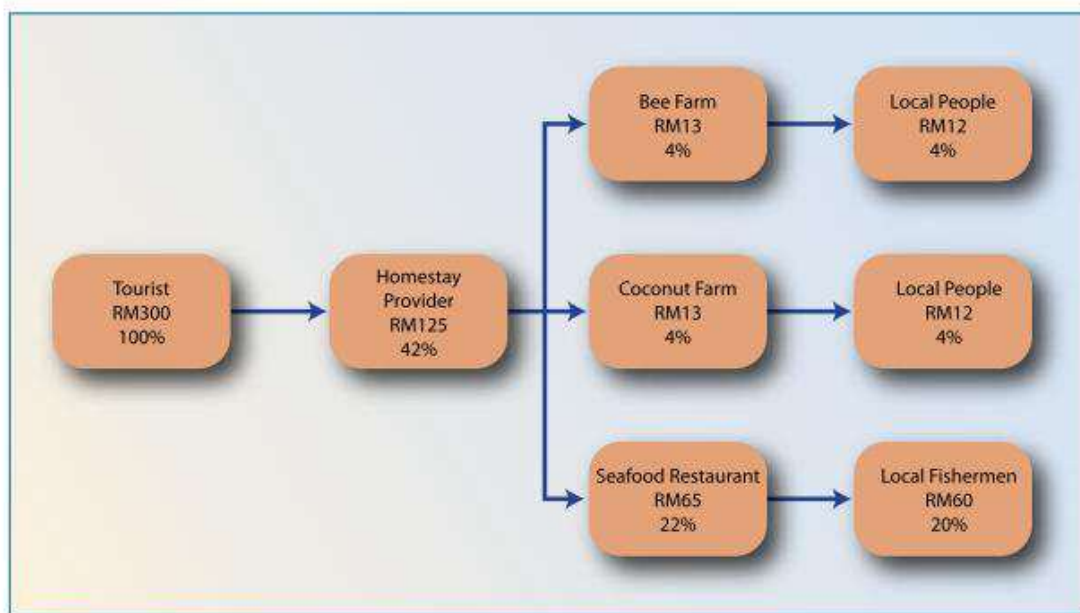


Figure 3: Accommodation linkages and tourist income distribution in Tanjong, Piai, Malaysia

When tourism-related income grows with a substantial reorientation in favour of the poor, poverty can be reduced. Local and national governments as well as investors and developers play a critical role in determining the role poorer populations play in the tourism industry. Tourism leaders can also help by engaging in and encouraging the use of local companies for the provision of transport, services and food in order to generate local income and employment multipliers and contribute to alleviate local poverty.

in 2002 the UNWTO launched the Sustainable Tourism for the Elimination of Poverty initiative (ST-EP), aimed at reducing poverty levels through developing and promoting sustainable forms of tourism (UNEP, 2011). ST-EP has identified seven different mechanisms through which the poor can benefit directly or indirectly from tourism:

- undertaking measures to increase the level of the poor working in tourism enterprises
- maximizing the proportion of tourism spending that is retained in local communities and involving the poor in the supply process
- promoting the direct sales of goods and services to visitors by the poor from informal businesses
- establishing and managing more formal tourism enterprises by the poor, either individually or at a community level
- using taxes or levies on tourism income or profits with proceeds benefiting the poor
- supporting the poor in money or in kind, by visitors or tourism enterprises

- investing in infrastructure that offers local communities the chance to gain new access to available resources

Environmental benefits

In hotels and other accommodation there is considerable scope for investment in energy-efficient features and services, including cooling (air conditioning), refrigeration, television and video systems, air conditioning and water heating, and laundry.

Internal water efficiency and management programmes, and investments in water-saving technology in rooms, facilities and attractions reduce costs and apply less pressure on scarce water resources.

Improved waste management provides opportunities for business and society. Lower levels of generation improves financial return for the private sector, and better management of that waste creates opportunities for jobs and enhances the attractiveness of the destination.

Sustainable tourism encourages effective conservation of sensitive ecosystems. It will encourage an increase in conservation and tourism revenues (including protected-area fees) resulting in a greater transfer of benefits toward natural areas.

Sustainable tourism will encourage the protection of cultural heritage, which includes living cultures as well as historical, religious, and archaeological sites.

Enabling Conditions for Tourism in a Green Economy

A set of enabling conditions is required for tourism to become sustainable: to contribute to social and economic development within the carrying capacities of ecosystems. A cross-cutting barrier to greener or more sustainable tourism investment is the lack of understanding and recognition of the value created for companies, communities and destinations from the greening of tourism. The sharing of knowledge, information and experiences among the public, private and civil society sectors is a necessary first step towards overcoming these barriers.

Private Sector Orientation

Tourism businesses and government institutions in charge of tourism should adopt innovative and appropriate technology to improve the efficiency of resource use (notably energy and water), minimize emissions of greenhouse gases (GHG) and the production of waste, while protecting biodiversity.

Enabling conditions for engaging the industry

Tourism promotion and management organizations and resource management agencies should link tourism products (for example, parks, protected areas and cultural sites) more closely with marketing positions. This will ensure a consistent and unique selling

position in world tourism markets based on high-value experiences at natural and cultural sites in a compact geographical area

Tourism industry associations and wider industry platforms play an important role in engaging tourism businesses in sustainability as well as developing practical tools to respond to many common challenges. As in most industries, the concept of corporate social responsibility (CSR) is increasingly recognized in the tourism sector and is being promoted by industry bodies, at the international and national levels. Governments and the private sector should develop mechanisms and tools such as triple-bottom-line reporting, environmental management systems and certification to facilitate the adoption of CSR in tourism enterprises, especially SMEs.

CASE STUDY

The Caribbean Tourism Organization works alongside the Caribbean Alliance for Sustainable Tourism on the Caribbean Hotel Energy Efficiency Action Programme to reduce carbon dioxide emissions in the region. The purpose of this project is to help make the tourism sector, and hotels in particular, more energy efficient and possibly obtain carbon credits through the reduction of carbon dioxide emissions. This project was implemented with the goal of making the participants eligible for the Climate Investment Fund that will help make further projects possible.

Government, private sector and civil society should engage with international development institutions, such as multilateral and bilateral cooperation agencies, to advocate for programmes that inform, educate and work collaboratively with the tourism industry to integrate sustainability into policies and management practices.

The increased use of industry-oriented decision-support tools would help speed the adoption of green practices. Hotel Energy Solutions, TourBench and SUTOUR are examples of projects designed to provide assistance to Europe's tourism enterprises to identify potential investments and cost-saving opportunities for sustainable decision making to ensure profitability and competitiveness (saving money and investment in ecological building measures and equipment with low energy consumption), provide visitor satisfaction (fulfilling their demands and expectations for high environmental quality), achieve efficient use of resources (minimizing the consumption of water and non-renewable energy sources), secure a clean environment (minimizing the production of CO₂ and reducing waste), and conserve biological diversity (minimizing the usage of chemical substances and dangerous waste products).

The promotion and widespread use of internationally recognized standards for sustainable tourism is necessary to monitor tourism operations and management. Criteria, objectives and targets can be identified and incorporated into tourism entities' investment plans and business operations. The GSTC provides a current comprehensive

system to enable private sector investment and should be adopted to assess the tourism industry's performance.

Destination Planning and Development

A country's tourism development strategy must be sensitive to its unique assets and challenges, while creating a vision to deliver its goals for sustainability. Advancing greening goals through tourism planning and destination development requires the ability and institutional capacity to integrate multiple policy areas; consider a variety of natural, human and cultural assets over an extended time frame; and put in place the necessary rules and institutional capacity.

Enabling conditions for greener destination planning

Tourism ministries, community and private tourism authorities must establish mechanisms for coordinating with ministries responsible for the environment, energy, labour, agriculture, transport, health, finance, security, and other relevant areas, as well as with local governments. Clear requirements such as zoning, protected areas, environmental rules and regulations, labour rules, agricultural standards, and health requirements (particularly for water, waste and sanitation) establish clear rules and define the operating climate for investment.

Organizations engaged in developing tourism strategies should make use of credible scientific methods and tools encompassing economic, environmental and social approaches and assessments for sustainable development that will help stakeholders related to different components of the tourism value chain understand their environmental and socio-cultural impacts.

Tourism master plans or strategies should include environmental and social issues to manage the critical assets and promote greener outcomes. These strategies should be based on assessment of carrying capacity and social issues to take into account external and internal impacts of tourism on the society. Green transformation programmes will be more effective if produced by a multi-stakeholder participatory planning process, as well as through the development of partnerships at local, national, regional and international levels. This process should include commitments to multilateral environmental and social agreements and the organizations that support them.

Fiscal Policies and Economic Instruments

The greening of tourism will require a more sophisticated use of instruments by the government, such as fiscal policy, public investment, and pricing mechanisms for different public goods. Tourism investment from government should focus on business motivations for sustainable management. Incentives should promote environmental protection and creation of economic value. Selected interventions must promote a more efficient allocation of goods and resources than would occur without government action. Social policy should address compensation and benefits to workers, access to

improved opportunities, human resource development, and value chain integration strategies.

Enabling conditions in fiscal and government investment policies

Policy intervention should promote the sustainable use of natural resources and therefore create positive externalities for the society. Less productive uses of natural resources (i.e. unsustainable agriculture) or possible depletion activities (i.e. housing construction) could be compensated (for their opportunity cost) with policy instruments that increase profitability for sustainable tourism businesses and generate positive environmental externalities. Free-riding (non-compliance by companies) should be prevented with an effective performance monitoring and impact evaluation mechanism.

Government investments in protected areas, cultural assets, water, waste management, sanitation, transportation and energy infrastructure investments will attract private sector investment decisions toward greener outcomes. Investments in public infrastructure related to tourism or investments in private tourism businesses should estimate their social and environmental impacts and adopt economic measures to compensate and offset unavoidable impacts.

Appropriate taxation and subsidy policies should be framed to encourage investment in sustainable tourism activities and discourage unsustainable tourism. Taxation can be used to keep developments within given limits (for example, taxes on use of resources and services) and controlling specific inputs and outputs (such as effluent charges and waste services).

Tax concessions and subsidies can be used to encourage green investment. Subsidies can be given on purchase of equipment or technology that reduces waste, encourages energy and water efficiency, or the conservation of biodiversity (payments for environmental services) and the strengthening of linkages with local businesses and community organizations.

Financing Green Tourism Investments

Environmental and social investments are relatively new, and remain outside the mainstream of financial markets. Therefore, effort is needed to raise awareness of green investment opportunities and to reduce uncertainty for banks and other investors.

Enabling conditions for finance

The single greatest limiting factor for SMEs in moving toward greener tourism is lack of access to capital for this type of investments. Green investments must be seen as adding value and made on their economic and financial merits, without prejudice. This will require greater private sector awareness of the value of green investment, and also policy coordination with Ministries of Finance and regulatory authorities.

Regional funds for local tourism development could help overcome financial barriers for green investments where investments also generate public returns (through positive externalities). Foreign Direct Investment (FDI), private equity, portfolio investment, and other potential funding sources should be aligned with sustainable projects and strategies for the tourism industry.

Countries should mainstream sustainability into tourism development investments and financing. The Sustainable Investment and Finance in Tourism (SIFT) network is working to integrate the expectations of private investors, the leveraged strength of the financing and donor community, and the needs of developing destinations. The SIFT network aims to encourage greater investments by public, private and multilateral investors in sustainable tourism.

Establish partnership approaches to spread the costs and risks of funding sustainable tourism investments. For example, in implementing sustainability projects, SMEs could benefit from in-kind support like technical, marketing or business administration assistance, from firms offering these services at low cost. In addition, loans and loan guarantees could include more favourable grace periods or offer longer repayment periods. Loans for sustainable tourism projects could be set up with guarantees from aid agencies and private businesses, lowering risk and interest rates.

Expand the use of solidarity lending mechanisms to permit groups of local suppliers to access credit and build capital. Solidarity lending (guarantees provided by a peer group) has proven successful in fisheries, agriculture, and handicrafts – all industries of critical importance to successful sustainable tourism destinations.

Enhance development bank access to individuals and small businesses that are not eligible for credit, or are involved in the provision of public services (such as protected areas management, guiding, waste management, infrastructure construction).

Establish seed funds to permit new green industries to develop locally. For example, solar collectors and photovoltaic systems can be imported as complete systems, or can be assembled locally from imported components. The latter encourages local investment and promotes local economic contribution. It also permits adaptation of the technologies to better suit local tourism needs.

Module 4 Main Project

- Select one national policy with which you are familiar – e.g. a national development policy or a sector-specific policy.
- Analyze the policy with respect to its contribution to facilitating a green economy.
- Determine what conditions or considerations should be added to improve its contribution to a green economy.

Module 5

Measuring Progress towards a Green Economy



Module 5: Measuring Progress towards a Green Economy

Overview of Module 5

Module 5 presents indicators which can be used to track progress towards social, economic and environmental outcomes of a green economy and links green economy indicators to the Millennium Development Goal (MDG) post-2015 targets.

Objectives of Module 5

The objectives of Module 5 are to:

- Examine which green economy indicators are appropriate for the Caribbean in general as well as for individual countries in the region.
- Discuss how green economy indicators can be linked to MDG post-2015 targets.

Measuring Progress toward a Green Economy

There is general consensus that the main indicators of economic performance, such as growth in Gross Domestic Product are inadequate to measure the green economy. These economic indicators need to be adjusted to account for pollution, resource depletion, declining ecosystem services, and the distributional consequences of natural capital loss to the poor.

Ideally, changes in stocks of natural capital would be evaluated in monetary terms and incorporated into national accounts. This is being pursued in the ongoing development of the System of Environmental and Economic Accounting (SEEA) by the UN Statistical Division, and the World Bank's adjusted net national savings methods (World Bank, 2006). The wider use of such measures would provide a better indication of the real level and viability of growth in income and employment.

CASE STUDY

The United Nations System of Environmental-Economic Accounting (SEEA) sets the statistical standards for collecting and integrating economic and environmental data for analysis of the green economy and sustainability.

The SEEA does not propose any single headline indicator; rather it offers a multi-purpose system - with many different analytical applications - that generates a range of indicators. The SEEA provides an agreed system for components, such as material flow accounts, input-output tables, as well as land and water use accounts, all of which provide the basis for measuring indicators such as energy and resource use at sectoral and economy-wide scales. The SEEA also provides a framework to integrate information from different sources and the basis on which consistent indicators comparable across countries and over time can be derived and disseminated. (UNEP, 2012)

Important advances have been made in the field of indicators for sustainable development over the last two decades. Appropriate indicators at both a macroeconomic level and a sectoral level will be essential to informing and guiding a transition to a green economy.

Green Economy Indicators

There are three principal areas for green economy indicators

Indicators of Economic Transformation

A green economy is first and foremost about transforming the way economies grow. Currently, growth is typically generated from investments in high emission, heavily polluting, waste generating, resource intensive, and ecosystem damaging activities. A

green economy requires investments to shift towards low carbon, clean, waste minimizing, resource efficient, and ecosystem enhancing activities. The key indicators of economic transformation, therefore, include the shift in investments (for example increase in investments in renewable energy) and, over time, the consequent growth of environmentally friendly or environmentally enhancing goods and services and related jobs (as discussed in Module 3). The contribution of green products and services can be measured using indicators such as value added (\$/year) and employment (jobs). See Table 5.

Table 5: Examples of policy interventions and related indicators

Policy	Indicators
Green investment	R&D investment (% of GDP) Investment in green goods and services (\$/year)
Fiscal reform	Fossil fuel, water and fishery subsidies (\$ or %) Fossil fuel taxation (\$ or %) Renewable energy incentive (\$ or %)
Pricing	Carbon price (\$/tonne) Value of biodiversity (\$/ha of forestland) Value of ecosystem services (e.g. water provision)
Green procurement	Expenditure in sustainable procurement (\$/year and %) CO ₂ and material productivity of government operations (tonne/\$)
Training	Training expenditure (\$/year and % of GDP) Number of people trained (persons/year)

Indicators of Resource Efficiency and Environmental Health

A major key to the achievement of, and benefit from economic transformation is improved resource efficiency. Principal indicators include those on the use of materials, energy, water, land, changes to ecosystems, generation of waste, and emissions of hazardous substances related to economic activities. See Table 6.

Table 6: Examples of environmental issues and related indicators

Environmental Issue	Indicators
Climate change	Carbon emissions (tonnes/year) Renewable energy (share of power supply) (%) Energy consumption per capita (Btu/person)
Ecosystem management	Forestland (ha) Water stress (%) Land and marine conservation area (ha)
Resource efficiency	Energy productivity (Btu/\$) Material productivity (tonne/\$) Water productivity (m ³ /£)

	CO ₂ productivity (tonne/\$)
Chemicals and waste management	Waste collection (%)
	Waste recycling and reuse (%)
	Waste generation (tonne/year) or landfill area (ha)
Total natural wealth	Value of natural resource stocks (\$)
	Net annual value addition/removal (\$/year)

Indicators of Progress and Well-being

A green economy can contribute to societal progress and human well-being in two ways:

- by redirecting investments towards green goods and services
- by redirecting investments towards the strengthening of human and social capital

Some of the indicators of progress and well-being include the extent to which basic human needs are fulfilled, the level of education achieved, health status of the population, and the availability of, and access by the poor to social safety nets. A number of these are covered by the Millennium Development Goals (MDGs). See Table 7.

Table 7: Examples of well-being and equity indicators

Well-being and Equity Area	Indicators
Employment	Construction (person, %) Operation and management (person, %) Income generated (\$/year) Gini coefficient/index ¹²
Access to resources	Access to modern energy (%) Access to water (%) Access to sanitation (%) Access to health care (%)
Health	Level of harmful chemicals in drinking water (g/litre) Number of people hospitalized due to air pollution Road traffic fatalities per 100,000 inhabitants

¹² The Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality (World Bank: <http://data.worldbank.org/indicator/SI.POV.GINI>). There are no data available for the Caribbean.

Figure 4 demonstrates how these groups of indicators are related to each other. Investments in key sectors of the green economy, together with policy reforms, should contribute to decoupling economic growth from resource use and environmental impacts.

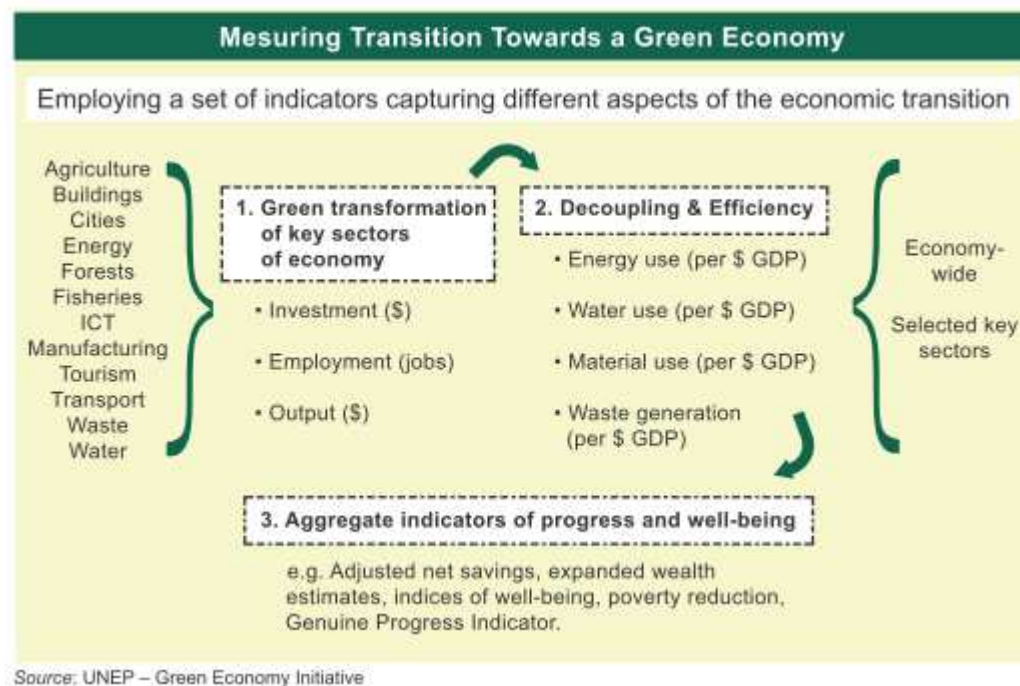


Figure 4: Indicators to Measure Progress toward a Green Economy

Such improvements can be related to key macroeconomic indicators, such as GDP, Human Development Index (HDI), poverty rates, and can even lead to refined measures, such as adjusted net domestic product taking into account depreciation of natural capital.

Data Needs and Capacity Building

The development of a framework for green economy indicators poses an important challenge: the needs and capacities of different countries in collecting and evaluating the required data and developing appropriate indicators.

Technical assistance and capacity building will be required in order to address the special needs of certain countries and to support the development of the necessary information systems. Developing and implementing basic monitoring and data collection systems, be it statistical or based on remote sensing or other techniques, is essential. Improved access to information and communication technologies (ICTs) by most countries in the past decade has provided a unique platform and window of opportunity to initiate concrete actions in this respect.

Most countries use different approaches and data classification systems when defining and evaluating the impact of economic activities on the environment. In all areas (e.g. production, consumption, material flows) there is a significant opportunity to improve data and information by regularly providing more analysis and better data in an internationally consistent format. This would make it much easier to monitor progress, make cross-country and cross-sector analyses, and identify in more detail the economic drivers that are responsible for impacts and the factors that determine the success of policies.

Comprehensive and harmonized data across countries and sectors are often not available. However, there are various international harmonized databases providing pieces of the overall picture, such as the International Energy Agency (IEA)'s energy database, the Food and Agriculture Organization of the United Nations (FAO) databases on land use, water use and agricultural production, and the United Nations Framework Convention on Climate Change (UNFCCC) greenhouse gas emission inventories (UNEP, 2012).

Green Economy Indicators and the Post-2015 Development Framework



The Millennium Development Goals set in 2010 constituted a blueprint agreed to by all the world's countries and all the world's leading development institutions to move toward sustainable development. The eight goals ranged from halving extreme poverty rates to halting the spread of HIV/AIDS and providing universal primary education by 2015.

At Rio+20, government leaders stressed the need for a transformative post-2015 development agenda to eradicate poverty and hunger and promote sustained and inclusive economic growth. The conference declaration included a proposal to replace the MDGs, due to expire in 2015, with a broader set of globally agreed sustainable development goals.

This proposal to establish a process for governments to define and commit to sustainable development goals will help to provide a focus for discussion on transition to a green economy.

"The Millennium Development Goals have been the greatest anti-poverty push in history. New partnerships have been established. New actors have been engaged. Now we must finish the job."

- Secretary General Ban Ki-moon at MDG Advocacy Group meeting, 2014

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