

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).

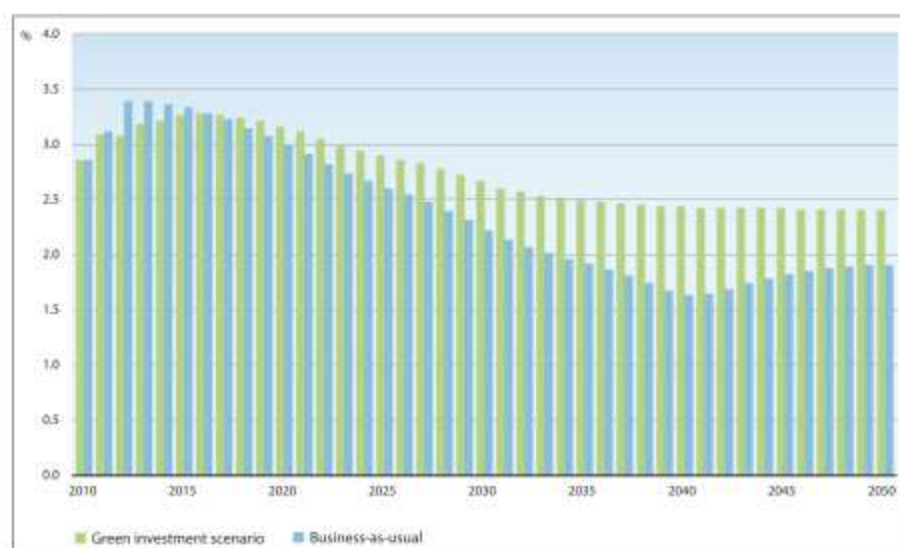


Figure 1: Projected trends in annual GDP growth rate.
(Source: *Modelling in Green Economy Report*, UNEP, 2011)

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

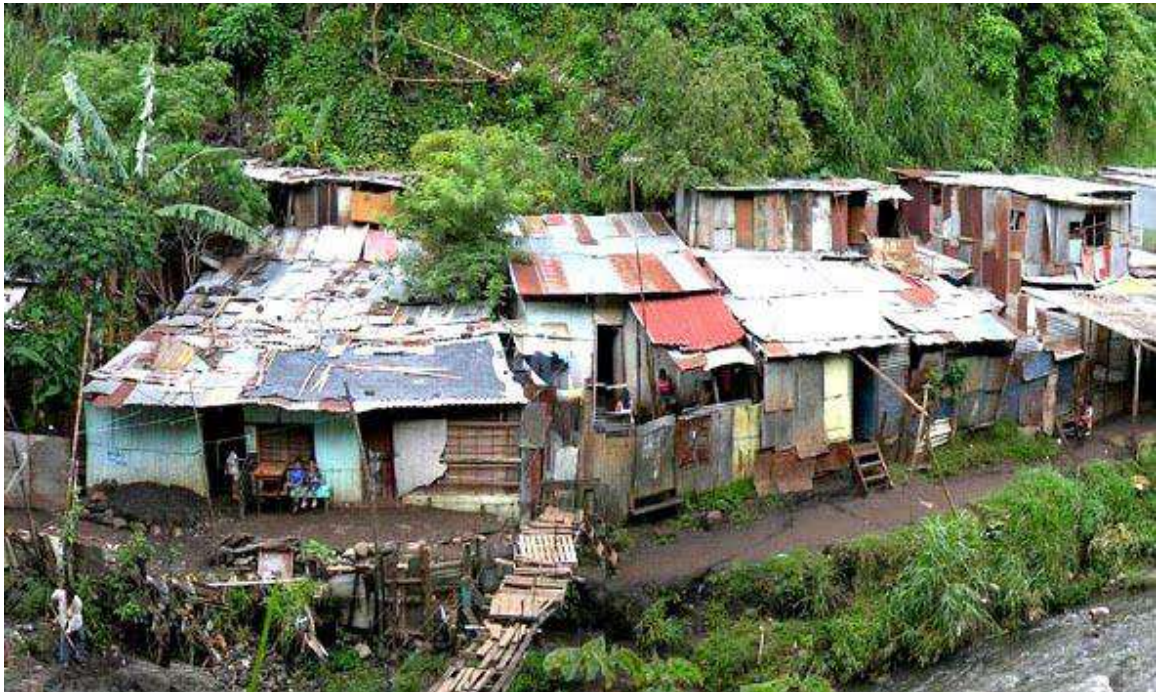
Green Economy Strategy	Impact on Poverty Reduction
	the same time link marginalized farmers with national and international supply chains.
Carefully crafted social safety nets build natural resources and reduce poverty	Social protection and livelihood security schemes for the rural poor can preserve 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

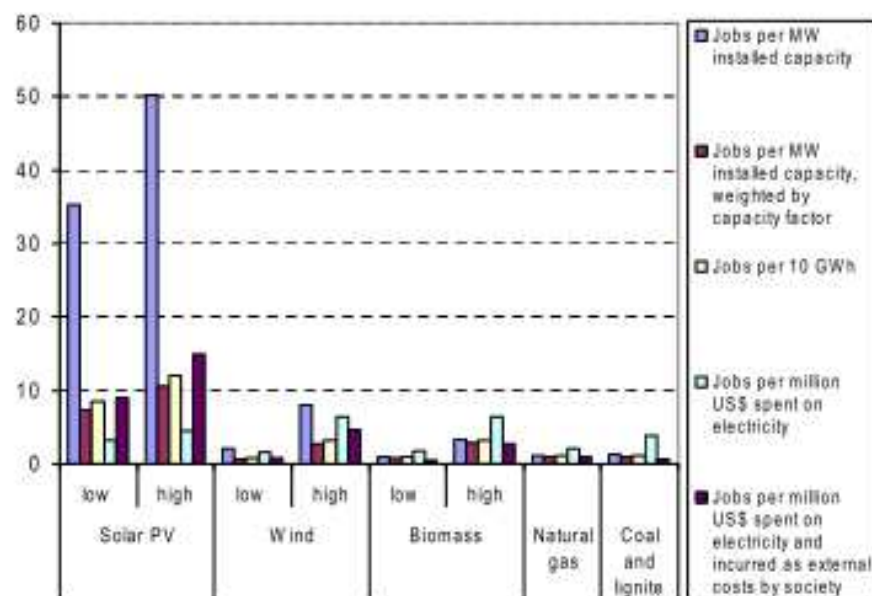
Sector	Environmental Measure
Energy supply	Integrated gasification/ carbon sequestration
	Co-generation (combined heat and power)
	Renewables (wind, solar, biofuels, geothermal, small-scale hydro); fuel cells
Transport	More fuel-efficient vehicles
	Hybrid-electric, electric, and fuel-cell vehicles
	Car-sharing
	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