

Inclusive green growth in Ghana: Selected case studies



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Acronyms and abbreviations

CFL	compact fluorescent light
CSPG	Cross Sectoral Planning Group
ECA	Economic Commission for Africa
ENRAC	Environment and Natural Resource Advisory Council
EPA	Environmental Protection Agency
FASDEP	Food and Agriculture Sector Development Policy
FC	Forestry Commission
FFF	Farmer Field Fora
GDP	gross domestic product
GE	Green Economy
GEDAP	Ghana Energy Development and Access Project
GG	Green Growth
GHG	greenhouse gas
GPC	good practice centre
GPRS	Ghana Poverty Reduction Strategy
GREL	Ghana Rubber Estates Limited
GSGDA	Ghana Shared Growth and Development Agenda
GSLWM	Ghana Sustainable Land and Water Management
IDA	International Development Agency
IGG	inclusive green growth
IPM	Integrated Pest Management
IPRSP	Interim Poverty Reduction Strategy Paper
ISSER	Institute of Statistical, Social and Economic Research
KfW	KfW Bankengruppe (Kreditanstalt für Wiederaufbau)
KVA	Kilo Volt Ampere
MC	Minerals Commission
MDAs	Ministries, Departments and Agencies
MEF	Micro Enterprise Fund
MESTI	Ministry of Environment, Science, Technology and Innovation
MLGRD	Ministry of Local Government and Rural Development
MLNR	Ministry of Lands and Natural Resources
MMDAs	Metropolitan, Municipal and District Assemblies
MOFA	Ministry of Food and Agriculture
MoFEP	Ministry of Finance and Economic Planning
MOTI	Ministry of Trade and Industry
MoEN	Ministry of Energy
NBSSI	National Board for Small-scale Industries
NCCC	National Committee on Climate Change
NCS	National Committee for Sustainable Development
NDPC	National Development Planning Commission
NED	Northern Electricity Department
NFPDP	National Forest Plantation Development Program
NGO	non-governmental organization
NREG	Natural Resources and Environmental Governance
OECD	Organization for Economic Cooperation and Development
PPPC	Programme for the Promotion of Perennial Crops
REDD+	Reducing Emissions from Deforestation and Forest Degradation Plus
RTIMP	Root and Tuber Improvement and Marketing Programme
RTIP	Root and Tuber Improvement Programme
SDAP	Sustainable Development Action Plan

SECO	Swiss Agency for Development and Cooperation
TOPP	Twifo Oil Palm Plantation
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WSSD	World Summit on Sustainable Development

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¹ Presently with the European Commission, Joint Research Centre, Institute for Energy and Transport.

Executive summary

A. Introduction

The present report on inclusive green growth in Ghana provides an account of the overall policy framework and mechanisms to promote inclusive green growth (IGG) in the country. It documents good practices, success stories and lessons learned in selected sectors of the country's economy. The report contributed to informing the fifth issue of the Sustainable Development Report on Africa, which was produced under the theme *Promoting sustainable development in Africa through inclusive green growth*. Producing the report involved a desk review and consultations with various stakeholders, and an analysis of data and information collected in this manner. The report also examined the implication of the findings for policy, including options to foster IGG in the selected sectors.

By documenting key successes, challenges, good practices and lessons learned in IGG in Ghana, this report aims to facilitate knowledge networking among member States and regional and sub-regional organizations. The goal is to promote the sharing of best practices, and the scaling up and out of success stories. The report is also expected to inform future initiatives on inclusive green growth in Africa.

B. Economic, social and environmental performance

An assessment of Ghana's macroeconomic situation and social and environmental development imperatives shows a country that has performed impressively in reviving its gross domestic product (GDP) growth after decades of poor performance. Ghana's GDP growth rate over the last decade has been among the highest in Africa and exceeded that of some high investment emerging market economies. The last five years have been spectacular, with real GDP growing at an annual average rate of 8.7 per cent. In the medium term the average real GDP growth rate in Ghana is expected to be at least 8 per cent per annum (11.3 per cent per annum GDP growth, inclusive of oil and gas production) mainly thanks to the consolidation of macroeconomic stability and policies to stimulate growth in the agricultural, industrial and service sectors. With the start of oil and gas production in 2010 Ghana is now well positioned to become one of Africa's leading 'commodity powerhouses.'

Although the population growth rate in Ghana has declined steadily in the past three decades (from 3.4 per cent in 1980 to 2.8 per cent in 1990 and to 2.4 per cent in 2010), the urban population has grown, posing challenges to urban development. The inability of the public sector to provide the necessary infrastructure and of the private sector to create employment opportunities for the growing urban population has resulted in the rapid growth of slums, poor housing and sewerage in the major cities of Ghana and high pressure on urban social services. While Ghana has made significant progress in reducing poverty (almost halved the percentage of people living below the poverty line from 52 per cent in 1992 to 28 per cent in 2006), poverty remains a challenge to development. Income and non-income disparities between the rural and urban populations, and between the three northern regions and the rest of Ghana continue to grow. With total unemployment having increased from 4.7 per cent in 1992 to 10.4 per cent in 2006, this also remains a major socioeconomic problem in Ghana. Unemployment is still higher among young people than other age groups, and among graduates it has been spiraling in the last decade.

In spite of these social challenges, Ghana has achieved remarkable success in improving indicators in education and health. Enrollment rates at the primary and secondary school levels have consistently increased. Adult literacy, among people aged 15 years and above, has increased marginally from about 58 per cent in 1999 to 67 per cent in 2009, while trends in life expectancy have remained quite impressive and higher than those of many countries in the subregion. Over the past two decades (1990-2010), infant mortality rates, under five mortality rates and maternal mortality per 100,000 live births have declined

consistently, proof that the country is making good progress towards achieving Goal 5 of the Millennium Development Goals.

The environmental situation is far from rosy. Ghana's concentration on producing primary products, especially oil and minerals, in the face of weak enforcement of environmental regulations, low value addition, poverty and limited bargaining power, has resulted in environmental degradation. Ghana is experiencing climatic variability and extreme events, such as floods or droughts, due to greenhouse gas (GHG) emissions from deforestation and the use of fossil fuels (coal, oil and gas) in industrial processes, transportation, homes and agricultural production (United Nations Framework Convention on Climate Change, 2005). Carbon dioxide emissions – the biggest contributor to climate change–have increased consistently over the last three decades, while natural resource depletion (forest, energy and minerals) as a percentage of the gross national income has increased in line with fossil fuel energy consumption. The emission of nitrous oxide has remained relatively stable, and methane emissions have increased while other greenhouse gasses emissions (HFC, PFC and SF6) have decreased significantly.

Ghana's overdependence on agricultural, timber and mineral resources has resulted in soil degradation, which has increased the susceptibility of a sizable portion of land to erosion. Prolonged land degradation, especially in the northern regions of Ghana, is further intensifying desertification, which has serious implications for poverty, migration and food security. A large portion of Ghana's forest cover has been lost to deforestation. It is estimated that an average 1.68 per cent of forest cover in Ghana was lost per year between 1990 and 2010. Ghana's humid tropical forests, among the most productive ecosystems in the world, risk losing natural habitat, species or subspecies. This is compounded by lack of recognition for indigenous knowledge and property rights. Although Ghana's endowment with abundant freshwater resources, such as rivers, lakes, wetlands and groundwater, has contributed significantly to the livelihoods of coastal communities and to the nation, regrettably, these water bodies are being polluted by poor waste management, agricultural and industrial discharges and mining, especially on the small scale.

Clearly in spite of its impressive growth, the attainment of low middle-income status and promising growth prospects, Ghana faces social and environmental challenges that need to be addressed. These are in part explained by the expansion of the oil and gas sector, which has raised Ghana's GDP while also increasing the rate of environmental degradation, particularly through loss of forest cover. Ghana is losing about 3 per cent of forests compared to 1.3 per cent recovery, thereby becoming a net carbon emitter. Although its social sector faces serious challenges, the country has not done very well in sustaining the environment. Therefore, by promoting IGG in Ghana, the Government seeks to ensure growth that is favourable to poor people, while at the same time realizing the goals of sustainable development.

C. *Inclusive green growth in Ghana*

Although the issues of inclusive green growth and the green economy (GE) have recently gained momentum at the highest political level, Ghana has since 1996 re-oriented all development policies around the three pillars of sustainable development–economic, social and environmental components–and more specifically around sustained poverty reduction, which is one of the core concerns of IGG. Ghana considers a green economy as being crucial to: pro-poor growth and the creation of decent employment for the majority of the people; good urban management and sustainable consumption and production; low-carbon emission and; effective integration of the three dimensions of sustainable development, among others.

In line with the Africa Consensus Statement to Rio+20, Ghana sees IGG and GE not as a substitute for sustainable development, but rather a way of realizing it. Over the past decade Ghana has implemented many IGG programmes and policies. Clearly, this is consistent with adopting a step-wise approach to a green economy that focuses on harnessing opportunities for IGG in selected sectors of the economy. From Ghana's perspective, transformation to a green economy means having sustainable recourse for policy

direction in pursuit of best IGG practices in specific sectors, including energy, transport, agriculture, water, forestry and urban management.

Beyond the IGG agenda, practical efforts are underway to facilitate effective integration of GE into the next development planning programme. Already the current national development blueprint—the Ghana Shared Growth and Development Agenda (GSGDA) has integrated climate change and the environment into key policy measures. Among key policy measures to mainstream climate change in the GSGDA are: identifying and enhancing early warning systems; improving land-use management as a way of enhancing national capacity to adapt to climate change; and adaptation to climate change through enhanced research and awareness creation. Being a new development paradigm, Ghana recognized the need to raise, discuss and address issues regarding the transition to GE through IGG. The aim was to ensure buy-in and ownership of the process. It is in this respect that a national workshop was convened to: appraise policymakers and development partners of the key Rio+20 outcomes and the implications for Ghana; mobilize political support for needed follow-up actions; and to launch stakeholder discussions on the concepts of IGG and GE.

Ghana recognizes that a shift from a conventional economy to a GE requires an assessment of win-win, low-cost and short-term IGG opportunities and policies/programmes so as to establish whether the transition to a GE is warranted. To this purpose a scoping study was commissioned to assess the areas where Ghana has a comparative advantage, by undertaking a cost-benefit analysis of the country's current green-growth path with its conventional system, using various assumptions and scenarios. The idea was to determine whether a green-growth path would benefit the country more than the conventional system, and, as such, help the Government to make informed decisions on the transition to a green economy. The scoping study on GE identified agriculture (cocoa and fisheries), land use (forestry and logging), energy and waste (electricity and water and sewerage) as the key sectors for IGG and for greening the Ghanaian economy. Based on a model framework that considered different scenarios, the scoping study concluded that moving towards a green economy had the potential to achieve sustainable development and eradicate poverty. The study stressed the importance of regulations, standards and targets in providing direction. It also underscored the need to create enabling conditions and provide adequate funding for IGG and for a successful transition to a green economy.

Apart from the GDGDA (Ghana's current development plan) there are several other policies, strategies, plans, legislative instruments and laws have been instituted that have implications for IGG. These include the:

- Renewable Energy Law, Bioenergy policy;
- Strategic National Energy Plan 2006-2020;
- National Environmental Sanitation Strategy/policy and Action Plan;
- Feed-in tariff;
- Food and Agriculture Sector Development Policy (FASDEP II);
- Medium-Term Agriculture Sector Investment Plan;
- National Transport Policy;
- National Environmental Sanitation Strategy and Action Plan;
- Strategic Environmental Sanitation Investment Plan;
- Energy Sector Strategy and Development Plan;
- The National Woodfuel Conservation Policy.

Case studies of good practices of inclusive green growth in Ghana

The ***Ghana Sustainable Land and Water Management (GSLWM)*** project is a five-year comprehensive approach to sustainable land and watershed management, financed by the Global Environmental Facility. It combines soft and hard investments at the community level, including maintenance of ecological infrastructure, with planning activities that could eventually morph into a much larger programme of water and flood management infrastructure across the Northern Savannah eco-agricultural zone. GSLWM was designed to reduce land degradation and enhance maintenance of biodiversity within the Northern Savannah region of Ghana.

GSLWM was expected to enhance efforts to close the economic growth gap between the north and the rest of Ghana, while increasing the northern regions' resilience to natural hazards and climate change. As an inclusive green-growth project, GSLWM was expected to enable land users to maximize economic and social benefits from the land while maintaining or enhancing the ecological support functions of land resources. The project is based on a win-win vision for the environment and the regional economy of the three northern regions of Ghana. By turning floodwaters into a productive asset through investment in modernized flood control and irrigation technologies, the project sought to exploit green drivers of growth that are compatible with improved watershed management

The ***Root and Tuber Improvement and Marketing Programme (RTIMP)***, a follow-up to the Root and Tuber Improvement Programme (RTIP) was launched to promote good practices along the value chain from the production to the marketing of roots and tubers. This was expected to increase the price farmers obtained from their produce and consequently reduce poverty among farmers. Expected to run for an eight-year period (2007-2014) as an inclusive green-growth intervention, the RTIMP integrates the three dimensions of sustainable development.

The RTIMP targets asset-poor, food-insecure and labour-deficient farming households seeking to improve their productivity and cultivation of roots and tubers for food and/or income generation. The goal of the RTIMP is to enhance income and food security in order to improve the livelihoods of the rural poor. The aim is to achieve this by: enhancing market relations within the root and tuber commodity chain to ensure a "pull" factor for increased production, and; helping create a better balance between supply and demand. Through collaboration with a wide cross section of stakeholders, the RTIMP has been able to achieve maximum economic, social and environmental impact at all stages of the root and tuber commodity chains.

Built on previous successful experiences, the ***Programme for the Promotion of Perennial Crops (PPPC)*** was designed to increase Ghana's income through rubber and palm oil exports (oil palm, copra), and help enhance its food self-sufficiency alleviate poverty and to boost sustainable development by combating climate change. Based on a tripartite relationship between the outgrower, technical operator and financial operator, PPPC was highly successful in boosting national food security. It increased growth in the incomes of households engaged in the project. Anecdotal evidence shows that the increase in the incomes of beneficiaries had an impact on their social life and status. In terms of the environment, PPPC was expected to have a positive effect on carbon sequestration and improve the fertility of degraded soils. The triangular relationship between outgrower, technical operator and financial operator has ensured the viability and sustainability of the PPPC project. It has also served as a basis for current efforts to replicate the project in other parts of Ghana and with other perennial crops like coconut.

The ***National Forest Plantation Development Programme (NFPDP)*** which was previously largely implemented in degraded forest reserves was re-launched in 2010 and expanded to cover private lands outside forest reserves, as part of the Expanded Plantation Programme. The overall goal of the NFPDP was to develop a sustainable resource base that would satisfy future demand for industrial timber and enhance environmental quality. This was expected relieve the pressure off the natural forest and accelerate the greening of the Ghanaian economy. Thanks to the collective involvement of the main stakeholders, the NFPDP was able to achieve maximum economic, social and environmental impact especially within Metropolitan, Municipal and District Assemblies (MMDAs) with degraded forest reserves.

The ***Ghana Energy Development and Access Project (GEDAP)*** was established to make the electricity distribution system in Ghana more efficient and increase the population's access to the commodity. As a IGG activity, GEDAP's goal was to support the transition to GE by reducing GHG emissions so as to boost a low-carbon economy. GEDAP was created to support the Government's vision of developing an energy economy that would secure the supply of high quality energy services for all homes, businesses, industries and the transport sector, while shoring up export earnings. GEDAP was expected to support economic empowerment by removing infrastructure barriers to business development and job creation accelerate access to affordable, modern energy for the rural poor in Ghana and promote renewable energy alternatives in areas not served by the national grid. This was to be achieved through innovative credit facility mechanisms that lower the upfront cash cost of solar lighting equipment for consumers, while improving the business environment for small energy entrepreneurs.

The programme to replace incandescent bulbs with compact fluorescent lamps (CFLs) and the ban on the importation of incandescent bulbs were part of the Government's efforts to solve acute energy crisis over the period August 2006 to September 2007. The main objective was to reduce household expenditure on electricity, eliminate brownout and transformer overloads and reduce carbon-dioxide (CO₂) emissions. The free exchange of incandescent bulbs for CFLs helped improve social relations between the Government and the people because it demonstrated the Government's resolve to address power crises in the country. The programme also offered opportunities to improve the country's capacity to adapt to climate change and mitigate existing and future emissions of CO₂. Additionally, it enabled households to save on their energy and electricity bills.

The ***initiation of the Capacitor Banks Project*** to improve ***energy efficiency*** was intended to address the inadequacy of energy in government institutions and thereby ensure that energy was used optimally. Most public institutions had been identified as high-energy consumers that incurred very high electricity bills, which the Government was obliged to pay. However, an energy audit revealed that the institutions had low-energy requirements. They were running inefficient equipment or machines that draw high electricity but used only a fraction for the actual work performed. Indeed the institutions could have met their needs efficiently through power factor correction. The installation of an automatic capacitor bank was to ensure that only the required amount of electricity needed to run equipment and other high-energy consuming machinery is loaded. It was expected to improve power factor, reduce energy demand and power factor surcharges and thereby enhance efficiency. This would ultimately lead to a decline in electricity consumption, which in turn would reduce government expenditure on power in public institutions thereby freeing up funds for other needs. The Government was highly indebted to utility companies as a result of its inability to pay huge electricity bills and on time. This had dire consequences for the companies' operational sustainability.

Challenges, opportunities and recommendations

The implementation of the seven inclusive green-growth projects, programmes and strategies has provided lessons concerning the measures or actions that determined the success of these case studies, constraints and challenges encountered in the implementation, and the manner in which the latter can be avoided.

The analysis of the seven cases of good practices contained in this report took into account sustainability and replication, and the projects' crosscutting nature. Project activities in the case studies were designed to support the use and valorization of local resources or technologies. Where this was not the case, the activities' design and implementation were integrated in climate change adaptation and mitigation. This concerned opportunities to improve Ghana's capacity to adapt to and mitigate existing and future GHG emissions. Some of the studies adequately addressed gender concerns by ensuring women's involvement in the projects and, in some cases, by directly targeting interventions at women. In terms of sustainability and replication, most activities under the various projects were expected to continue or have continued beyond the initial implementation phase. Generally economic, social and environmental benefits from the projects were expected to continue to accrue over time. Thanks to the projects' success, efforts are under way to replicate IGG project activities in other sectors and across the country.

The challenges that Ghana faces in its quest to promote IGG activities and the transition to GE include:

- Obtaining the necessary finance for the high initial cost of IGG investments;
- Ensuring the sustainability and replicability of projects (directly linked with the finance challenge);
- Ensuring effective monitoring and evaluation of projects, which is an effective way of learning lessons in order to make replicability easy;
- Ensuring that IGG initiatives help reduce poverty; this mainly refers to projects which, while meeting the general conditions for a GE project, may or help reduce poverty and bring about inclusiveness;
- Securing firm commitments from the political leadership to implement IGG projects, which, nevertheless, have long-term benefits. The nature of green investments makes it unpopular with political leaders, who is more interested in short-term social returns from projects;
- Difficulty in embedding IGG in long-term strategies;
- Unfulfilled pledges by the international community owing to harmful conditionalities, and the country's inability to negotiate better deals;
- Enhanced involvement of stakeholders, and legal backing for IGG activities.

There are enormous opportunities for promoting IGG activities in Ghana to advance GE in the long term. With regards to agriculture and land use management, Ghana is greatly endowed with natural resources that can be sustainably exploited to green its growth. The abundance of fresh water bodies is a major opportunity for IGG investment in intensive aqua farming. This will generate employment between farming seasons, benefitting the large non-farming rural labour force. Not only are GSLWM and RTIMP enjoying relative success, but are also accepted by communities and individuals. This bodes well for continuous efforts to educate rural communities on the need to adopt sustainable agricultural methods, and to build their capacity to this end. Documentation of success stories as part of the RTIMP, for instance, is another way of sharing with, other rural communities and farmers, examples of how sustainable use and management of land and water resources can be beneficial. The success of the PPC project under the triangular outgrower scheme has demonstrated the importance of securing its beneficiaries' commitment by offering them part ownership in it.

Ghana's forestry sector offers opportunity for inclusive green-growth investments. The Government and communities alike will accept green investments in agro-forestry, afforestation and woodlot plantations in areas that are threatened by desertification, especially in the northern Savanna regions, having already accepted this as a way to achieve sustainability. Investment in promoting the cultivation of economic trees, such as rubber and cocoa, to recover degraded forest areas and protect existing forest reserves would also appeal to many communities. There are also opportunities for green investment in identifying, and marketing all ecosystem services that have so far remained unmarketed in Ghana. These include the payment of incentives to communities and individual forest landowners to deliver ecosystem services, such as watershed protection, biodiversity, recreation, and carbon storage.

Ghana has an enormous opportunity to generate cleaner energy for development, thanks to its endowment with renewable resources, such as forests, and its natural fuel sources, including wind, water and solar power. Policies, laws and regulations are in place to liberalize energy generation and support renewable energy development. Compared to other countries within the sub-region, Ghana has increased its per capita income considerably, which means that renewable energy is potentially within the reach of the average citizen. Many high-income households are reportedly shifting to the use of solar systems to guarantee their energy security. There are other economic and political opportunities that make investment in IGG projects feasible in Ghana. This report recommends:

- The introduction of public-private partnerships in the implementation of IGG projects to address the financial challenge of the high initial cost of investments in GE,
- An improvement in local resource mobilization through innovative financial mechanisms for GE activities in order to address the financial constraints inherent in the implementation of IGG activities;
- Recognizing that IGG processes can be revised through the constructive use of information on progress towards their sustainability and replicability;
- The improvement of mechanisms for monitoring, following up, evaluating, offering feedback on and verifying IGG projects;
- Embedding IGG in realistic long-term green-growth development strategies;
- Enhancing coordination mechanisms of stakeholders in IGG sectors to reduce the duplication of efforts and create beneficial linkages;
- Capacity development and technology adoption to ensure the effective implementation of market-based environmental policies;
- Building and sustaining strong links between local technological institutions and the generation and users of technologies to ensure the vertical and horizontal integration of technology in IGG activities;
- Implementing market-based policies as an important tool for environmental policy management, thereby harnessing IGG in Ghana;
- Ensuring that IGG initiatives contribute to poverty reduction objectives;
- Involving the private sector, especially the financial sector, in the formulation and implementation of IGG policies to gain their acceptance and to form partnership with them, and;
- Integrating the implementation of such donor funded IGG projects directly into government programmes.

1. Introduction

1.1 Background

The Sustainable Development Report on Africa is produced by the Economic Commission for Africa (ECA) in collaboration with partner institutions. Launched in 2004-2005, this biennial publication was aimed at monitoring and assessing sustainable development in Africa, and promoting a balanced integration of the three pillars of sustainable development—economic, social and environment.

Already four issues of the Report have been produced under the following themes: *Managing Land-Based Resources for Sustainable Development*; *Five-Year Review of the Implementation of the World Summit on Sustainable Development Outcomes in Africa (WSSD+5)*; *Sustainable Consumption and Production (SCP) for Sustainable Growth and Poverty Reduction*; and *Managing Africa's Natural Resource Base for Sustainable Growth and Development*.

The fifth issue of the Report is being produced under the theme “*Achieving Sustainable Development in Africa through Inclusive Green Growth*”. It builds on previous editions and, among other things, it aims to: provide a holistic assessment of progress towards sustainable development in Africa; identify challenges to and opportunities for promoting inclusive green growth in Africa; facilitate knowledge networking among member States and regional and sub-regional organizations, and; help scale up and out success stories on inclusive green growth in Africa.

The theme was chosen, inter alia, because several African countries, including Ghana, have already begun identifying opportunities for and challenges to inclusive green economy and have to some extent adopted GE and growth strategies. Additionally, green growth was discussed in several regional platforms, such as the Seventh African Development Forum organized by jointly ECA, the African Union Commission and the African Development Bank in October 2010, and featured in Rio+20. Regarding the transition to a green economy, in its outcome document the Africa Regional Implementation Meeting (RIM) for the Rio+20 follow-up processes, (Africa RIM), recommended a step-wise approach focusing on investments, with accompanying enabling measures, targeting selected economic sectors to spur inclusive green growth. This would help document good practices and learn lessons that would inform the transition in the medium- to long-term. The meeting also reiterated the need to incorporate the green economy in national priorities and ensure that the transition takes into account Africa's level of development.

The present report is one of four commissioned by ECA to promote the up- and out-scaling of successful approaches to inclusive green growth in selected sectors of the economy and to inform the cases studies featured in the fifth issue of the Sustainable Development Report on Africa. The other three countries are Ethiopia, Morocco and South Africa. The report provides a comprehensive analysis of Ghana's experience in implementing inclusive green growth. It describes the overall policy framework and mechanisms to promote inclusive green growth, and documents good practices in selected sectors. It analyses key successes, challenges, good practices and lessons learned, as well as their implication for policy, including policy options to foster inclusive green growth in the selected sectors. The report uses its findings to advance recommendations on how to address the constraints and move forward the inclusive green growth agenda in Ghana.

1.2 Technical approach and methodology

To identify and assess good practices for IGG in Ghana, the following key points were taken into account:

- Tracking of key IGG activities;
- Defining and understanding GE and IGG in Ghana;
- Analysis of challenges and successes in developing and implementing IGG activities in Ghana;
- Analysis of opportunities in promoting and achieving inclusive green growth;
- Identification of case studies and good practices in key economic sectors identified in the fifth issue of the Sustainable Development Report on Africa SDRA as relevant for Ghana, where government policies and public and private investment can drive IGG, promoting value addition and achieving win-win results and development that can showcase the benefits of IGG;
- Providing a quantitative assessment of benefits and costs associated with the identified best practices, and a qualitative analysis, wherever possible;
- Policy options and tools to foster inclusive green growth in the country; and
- Addressing cross-cutting issues, such as gender, climate change, employment (particularly for the youth), poverty reduction, science and technology.

As such, the study consulted the: Ministry of Environment, Science, Technology and Innovation (MESTI); Ministry of Lands and Natural Resources (MLNR); Ministry of Food and Agriculture (MOFA); Environmental Protection Agency (EPA); Forestry Commission (FC); National Development Planning Commission (NDPC); Ministry of Trade and Industry (MoTI); and the Ministry of Energy and Petroleum (MoEn). Also consulted were private sector representatives, including the Association of Ghana Industries, the Ghana Chamber of Commerce and the Ghana Chamber of Mines, as well as representatives of civil society organizations and academics from the University of Ghana's Department of Geography and Human Resources and the Department of Economics, Legon-Accra.

The report also consulted national documents including the:

- Ghana National Assessment Report on Achievement of Sustainable Development Goals and Targets –MESTI;
- Technology Needs Assessment – EPA;
- Green Economy Scoping Study - Institute of Statistical, Social and Economic Research (ISSER), University of Ghana, Legon;
- Ghana Goes Green –MESTI;
- Draft National Climate Change Policy, Ghana Shared Growth and Development Agenda NDPC (2010);
- Strategic Environmental Assessment of National Transport Policy Report – EPA;
- National Environmental Policy - MESTI (2010);
- National Climate Change Adaptation Strategy - EPA/UNDP/UNEP (2010);
- Sustainable Development Action Plan (SDAP) “Securing the Future for the Next Generation of Ghanaians”, National Programme on Sustainable Consumption and Production for Ghana (2011-2016)- Volumes 1 and 2 - EPA and UNEP (2010);
- Ghana Country Report for WSSD of 2002; and
- The Country Environmental Assessment of 2006 and 2011 – European Union.

To gain a broader perspective other documents were taken into account, and included the Rio +20 Outcome Document; Africa Consensus Statement to Rio+ 20; Report on Progress Towards Sustainable Development in Africa; Africa RIM outcome document; Report on CFSSD-8 and Africa RIM; United Nations Environment Programme (UNEP) GE Reports; United Nations Department of Economic and Social Affairs series and papers on GG; and the OECD Report on GG in developing countries.

1.3 Organization of the report

The report is organized as follows: Following this introductory chapter, Chapter 2 provides an overview of the macroeconomic environment, social and environmental situation and inclusive green economy in Ghana. Chapter 3 discusses policy framework to promote inclusive green growth and presents good practices in selected sectors. Chapter 4 discusses challenges and opportunities to promoting inclusive green growth in the country. Chapter 5 concludes the report and proffers recommendations on the basis of the findings.

2. Macroeconomic environment, social and environmental development imperatives and green economy in Ghana

2.1 Overview of macroeconomic environment

Ghana's economic growth over the last decade has been among the fastest in Africa and surpassed that of some high investment emerging market economies. The country's economy has grown moderately but consistently over the past 25 years, at an average rate of five per cent between 1990 and 2010. Achievement in the last five years has been spectacular, with real GDP growing at annual average rate of 8.7 per cent. This is mainly attributable to relative macroeconomic stability and public sector reforms. Of equal importance has been the consistent application of the inflation targeting framework, which has lowered inflation and eased access to low-cost credit for the private sector to flourish, boosting the prices of Ghana's primary exports and attracting substantial inflows of external financing.

With the start of oil and gas production, Ghana is poised to become one of Africa's leading 'commodity powerhouses'. Substantial foreign investments have been placed in the oil and gas sector, and oil revenue is expected to eventually contribute some 20 per cent of total national revenue. Gold and other minerals, cocoa and oil provide a diversified commodity backbone that will underpin the country's rapid industrialization and sustained economic growth. The Government is pursuing macroeconomic stability and growth-oriented programmes that are consistent with Ghana's medium- and long-term objectives of becoming a modernized industry-driven middle-income country.

The service sector, whose growth has consistently outpaced that of the industrial and agricultural sectors (see Chart 1) since the early 1990s, is the force behind the overall growth of Ghana's economy. The exception was in 2006, 2008 and 2011 when the industrial sector grew faster than the service sector. Revised estimates for 2012 show that the service sector, which is also the largest sector, recorded the highest growth: 10.2 per cent. This was followed by the industrial sector (7.0 per cent), with agriculture recording the lowest growth at 1.3 per cent. The industrial sector's remarkable growth in 2011 was due to the launch of commercial petroleum production in the Jubilee Fields.

The increase in real GDP growth rate also translated to an increase in the real per capita GDP growth rate from 2.8 per cent in 2009 to 5.8 per cent in 2010, and a substantial increase to 12.3 per cent in 2011 (as

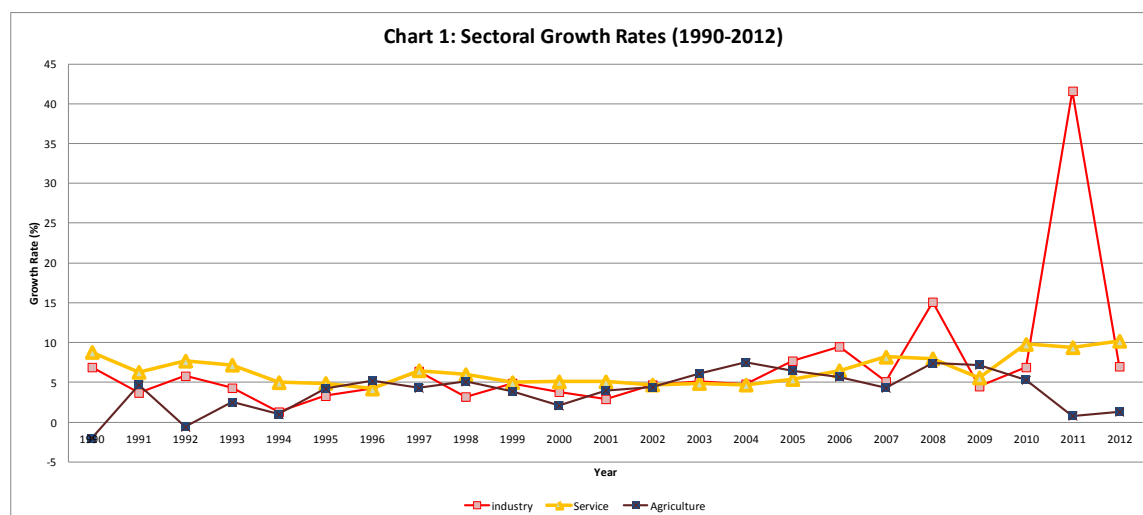


Table 1 Selected performance indicators, 2008-2012

Indicator (%)	2008	2009	2010	2011	2012	Average	
						2000-2007	2008-2012
Real GDP growth	8.4	4.0	8.0	15.0	7.9	5.2	8.7
Real per capita GDP growth	4.8	2.8	5.8	12.3	5.8*	2.7	6.3
Sectoral growth rates							
Agriculture	7.4	7.2	5.3	0.8	1.3	5.1	4.4
Industry	15.1	4.5	6.9	41.6	7.0	5.1	15.0
Services	8.0	5.6	9.8	9.4	10.2	5.6	8.6
Sectoral contribution to GDP							
Agriculture	31.0	31.8	29.8	25.3	22.7	34.6	28.1
Industry	20.4	19.0	19.1	25.6	27.3	23.9	22.3
Services	48.6	49.2	51.1	49.1	50.0	34.7	49.6

Source: Ghana Statistical Service, National Accounts Statistics.

shown in Table 1), based on a population growth rate of 1.9 per cent. Compared to an annual average real per capita GDP growth rate of 3.8 per cent between 2005 and 2009, Ghana's impressive growth in real GDP per capita over the last five years has enabled it to obtain the low middle-income status.

The service sector's contribution to GDP underpinned its impressive role in enhancing real GDP growth. ISSER (2012) asserts that the rebasing of the national account estimates¹ (intended to allow for a more accurate portrayal of various economic sectors' relative contribution to the GDP) revised the service sector's contribution to about 51.1 per cent of the GDP in 2010, followed by the agricultural sector (29.8 per cent) and industry (19.1 per cent). The service sector's dominance continued and in 2012, it accounted for about half of the GDP, with industry—the second largest sector after the service sector—accounting for 27.3 per cent, while agriculture accounted for 22.7 per cent. Although the estimates (Table 1) show an improvement in agricultural growth in 2012 compared to 2011 (0.8 per cent), its contribution to the economy continues to decline, with its share dropping from 25.3 per cent of the GDP to 22.7 per cent.

The monetary policy achieved an end-of-year alarming inflation of 8.8 per cent, exceeding the target rate of 8.5 per cent and the 8.6 per cent achieved at the end of 2011. In spite of inflationary pressures from rising oil prices and exchange rate pass-through, inflation was kept in single digits largely because seasonal factors suppressed food-price increases. The low single digit inflation rate recorded in 2012 did not reflect in the growth in money supply. In 2012, money supply (M2+) grew by 24.3 per cent compared to 33.2 per cent, 27.2 per cent and 26.94 per cent in 2011, 2010 and 2009, respectively. Reserve money registered an annual growth of 36 per cent in 2012 compared with 31.1 per cent in 2011.

In the fiscal year 2012, the overall budget balance (including divestiture receipts) registered a deficit of about 12.0 per cent of the GDP, against a target deficit to 6.7 per cent. The deficit was financed mostly from domestic sources, resulting in a net domestic financing equivalent to 9.8 per cent of the GDP, against a target of 4.0 per cent. On a year-on-year basis, total tax revenue for the period grew by 28.0 per cent.

As a result of global recovery and subsequent strengthening of commodity prices in 2010 and 2011, Ghana's balance of payment position was expected to improve in 2012 because of better export earnings. Estimates indicate that the trade balance recorded a deficit of US\$ 4,221.4 million in 2012, pointing to further deterioration in comparison to a deficit of US\$ 3,052.3 million in 2011. This was because of an increase in imports relative to marginal gains in export earnings.

¹ The rebasing of the national account estimates was done in 2006. Since then, national account estimates have been computed on the rebased economy.

The worsening trade balance, as well as increased outflows from services, income and current transfers, resulted in a current account deficit of US\$ 4,921.5 million (12.3 per cent of the GDP) in 2012 compared to US\$ 3,541.4 million (9.0 per cent of the GDP) recorded in 2011. The capital and financial account stood at US\$ 3,090.5 million in 2012, compared with US\$ 4,479.3 million in 2011, and was explained by higher short-term capital and net official capital outflows. These developments resulted in an overall balance of payments deficit of US\$ 1,210.9 million in 2012, compared to a deficit of US\$ 546.5 million in 2011.

Current estimates put the average medium-term real GDP growth rate in Ghana at no less than 8 per cent per annum, thanks mainly to the consolidation of macroeconomic stability, and policies to stimulate the growth of the agricultural, industrial and service sectors and also to the generation of employment. When the impact of oil and gas production is taken into consideration, the average real GDP is projected to grow at 11.3 per cent per annum over the medium-term and this will be expected to double the projected real per capita GDP growth.

Ghana's growth prospects have implications for promoting IGG and transitioning to a GE. Current policies to stimulate the growth of the agricultural sector make provisions for the indirect promotion of IGG and the transition to GE. These include mainstreaming sustainable land and environmental management practices in agricultural sector strategies designed to meet the medium-term GDP growth prospects, develop economic and service infrastructure in rural Ghana to support agricultural activities and pursue a low carbon-growth economy.

2.2 Social and environmental development imperatives

Social situation

Although it is considered a small country, Ghana has seen its population increase over the past three decades from 10.9 million in 1980 to about 14.8 million in 1990 and some 24.4 in 2010. It is worth noting that the country's population growth rate declined steadily from about 3.4 per cent in 1980 to about 2.8 per cent in 1990 and around 2.4 per cent in 2010. Urban population has grown faster than the overall population in Ghana, posing an additional challenge to urban development owing to the inability of the Government and the private sector to create the necessary infrastructure and employment in urban areas. In 1980, about 31 per cent of the population lived in urban centres. This figure rose to about 44 per cent in 2000 and, subsequently, to around 52 per cent in 2010. Rapid urbanization in Ghana is accompanied with urban poverty, which can be associated with the mushrooming of slums, poor housing and sanitary conditions and high pressure on urban social services (water, education, electricity, transport, etc.).

Total fertility in Ghana has dropped to some extent over the past two decades, indicating that overall population control measures have a positive, albeit marginal, impact. The fertility rate has decreased from about 5.6 births per woman in 1990 to about 4.2 in 2009. The prevalence of HIV increased consistently from 0.5 per cent of the population aged between 15 and 49 in 1990 but decreased thereon to about 1.8 per cent in 2009. Trends in life expectancy are quite impressive and higher compared to many countries in the subregion. The average life expectancy of Ghanaians increased from about 56.8 years in 1990 to 63.4 years in 2009. There are gender disparities in life expectancy in favour of females.

Over the past two decades (1990-2010), infant mortality rates and mortality rates for children under five have declined consistently. Infant mortality rates declined by a third from 76.7 in 1990 to 51.3 per 1,000 live births in 2009; mortality rates for children under five also declined approximately by a third, from 121.7 to 76.6 per 1,000 live births over the same period. Interventions in the health sector, such as the National Health Insurance Scheme, the free maternal health care, the exclusive breast-feeding campaign, as well as general improvements in socioeconomic conditions, may have helped lower mortality rates. Modeled estimates of maternal mortality ratio by the Maternal Mortality Estimation Interagency Group indicate a drop from about 630 per 100,000 live births in 1990 to about 350 in 2008. In spite of continu-

ing efforts to combat malaria, reported cases of the disease remain rather high. In the 2000, reported cases of malaria averaged 3154.2 thousand per annum compared to 1861.4 thousand in the 1990s.

Ghana has one of the highest literacy rates in the West African sub-region. According to the World Bank's World Development Indicator database, between 2000 and 2009, the situation improved slightly, reflecting the Government's commitment to eliminating illiteracy. Specifically, literacy rates among adults aged 15 and above in Ghana have increased by 8.7 per cent from 57.9 per cent in 1999 and to 66.6 per cent in 2009. A gap still persists in the male-to-female ratio although it narrowed slightly from 1.33 per cent in 1999 and to 1.21 per cent in 2009. While literacy rate among males 15 years and above rose from 66.4 per cent in 2000 to 72.8 per cent in 2009, that of females increased from 49.8 per cent in 2000 to 60.4 per cent over the same period. It is therefore imperative to implement policies that will remove literacy gaps that are unfavorable to women.

Enrolment ratios have improved consistently between 1999 and 2009. The gross primary school enrolment ratio for males and females has increased consistently from 79.6 and 84.2 in 1999 to 105 and 106 respectively in 2009. It should be noted that the gap between the male and female gross enrolment ratio for primary school dropped from about 12 per cent in 1990 to about 6 per cent in 1991 and subsequently to about 1 per cent in 2009. In primary school the gross enrolment ratio of over 100 per cent points to the existence of over-age and under-age students as a result of early or late school entrance and repetition. The implementation of social policies, such as the Ghana School Feeding Programme, Capitation grant, provision of school uniforms and the Livelihood Empowerment Against Poverty programme, among others, possibly account for the increase in enrolment in the 2000s.

In secondary school gross enrolment ratios have increased over the years but the gender gap in favour of males has narrowed marginally compared to primary school enrolment. Total male and female secondary gross enrolment ratios were 35.2 per cent, 42.2 and 27.9 per cent in 1990 respectively. Male and female secondary gross enrolment ratios increased from 39 per cent, 44 per cent and 35 per cent in 1999 to 57 per cent, 61 per cent and 54 per cent in 2009 respectively. While the male to female gross enrolment gap persisted over the past decade, some progress appears to have been made in closing the gap. The gap narrowed from 14 per cent in 1990 to 9 per cent in 1999 and subsequently to 7 per cent in 2009. Available information on the tertiary gross enrolment ratio shows that the figure was low in the 1990s for both sexes but has increased considerably over the past two decades. Again the difference in enrolment ratios between secondary and tertiary education is quite significant, but better compared to the sub-region.

Poverty still remains a serious development challenge for Ghana. Available information suggests that over the past two decades Ghana has achieved significant results in reducing poverty, cutting it nearly by half and lowering the percentage of people living below the national poverty line from 51.7 per cent in 1992 to 39.5 per cent in 1998/99 and further to 28.5 per cent in 2006. The incidence of poverty among urban households is consistently lower than among rural households. Trends in headcount poverty in rural and urban areas decreased from 63.6 per cent and 27.7 per cent in 1991/92 to 39.2 per cent and 10.8 per cent respectively in 2005/06. The decline in income poverty has had a positive effect on overall development and non-income poverty. Over the past five years (2006-2011), the country moved five places to 135th position in the human development index country rankings. The multidimensional poverty index², a comprehensive measure of non-income poverty introduced by the UNDP and the Oxford Poverty and Human Development Initiative in 2010, also declined from 0.309 in 2003 to 0.144 in 2008, a further confirmation of increasing levels of wellbeing.

Despite the fall in the headcount poverty, income and non-income inequalities have continued to grow, especially between the three northern Regions and the rest of the country. The Gini coefficient increased from 35.3 per cent in 1991/92 to 37.8 per cent in 1998/99 and further to 39.4 per cent in 2005/06. The Gini index of consumption inequality has also risen since 1991/92 for urban and rural households alike.

2 This index measures non-income poverty in the areas of health, education, and standard of living. The index ranges from zero to one, with low value implying lower levels of multidimensional poverty.

Table 2 Trends in unemployment

Year	Unemployment, total (% of total labour force)	Unemployment, male (% of male labour force)	Unemployment, female (% of female labour force)	Unemployment, youth total (% of total labour force ages (15-24))
1992	4.7	3.7	5.5	17.1
1999	10.1	9.4	10.7	15.9
2006	10.4	10.1	10.7	16.6

Source: World development indicators of the World Bank.

Unemployment remains a major socioeconomic problem in Ghana. According to available data, total unemployment increased from 4.7 per cent in 1992 to 10.1 per cent in 1999 and further to 10.4 per cent in 2006. Unemployment is not only disproportionately higher among women but they are also at the lower rank in the workplace and in the informal sector, where employment conditions are below labour standards. While unemployment among the youth is higher than among other groups, this trend is declining.

A more worrying trend in Ghana is the spiraling unemployment among university graduates, and this has serious implications for sustainable development. While there are no available data on current unemployment for this group, it is evidently a very high figure given that the number of graduates churned out by the various public and private institutions surpasses the growth of paid employment. Additionally, while Ghana's service sector has been making a considerable contribution to the GDP, this has not helped improve well-being owing to the sector's inability to absorb labour. The reason is because employers in the sector concentrate on improving labour productivity to reduce their labour input and wage bill. As a result, the sector has grown tremendously without creating many jobs.

Environmental situation

Climatic variability and change are evident in many parts of Ghana. Almost all Africa is observing an increasing trend in the frequency of high maximum temperature events (World Meteorological Organization, 2003). With regards to precipitation, Ghana is experiencing climatic variability and extreme events such as floods or drought. The main causes of climate change are greenhouse gas emissions from: the use of fossil fuel energy (coal, oil and gas) in industrial processes, transportation and in homes, and in agricultural production; and deforestation (United Nations Framework Convention on Climate Change, 2005). Carbon dioxide is the most important contributor to climate change, accounting for about 50 per cent of the overall global warming effect arising from human activities. Trends in carbon dioxide emissions for Ghana have increased consistently from 3,931kt in 1990 to 6,289 kt in 2000 and further to 8,999 kt in 2010³. The rise in carbon dioxide emissions was a result of increased fuel consumption and forest cover loss over that period. Although per capita carbon dioxide emissions have averaged about 0.3 metric tons and fall far below the world average, the Government of Ghana has put in place policies to reduce them. Indeed one of the main reasons why Ghana introduced the replacement of incandescent bulbs with CFL bulbs in 2007 and the National Forest Plantation Development Programme in 2010 and was to reduce carbon dioxide emissions

Natural resource depletion (measured as the sum of forest, energy and mineral depletion as a percentage of gross national income) has increased from 1.5 per cent in 1991 to 4.3 per cent in 2001, and then to 6.4 in 2009. This is in line with fossil fuel energy consumption as a percentage of total energy consumption, which increased from 16.6 per cent in 1991 to 26.5 per cent in 2001 and further to 34.3 per cent in 2009⁴. Additionally, the number of tractors per 100 square kilometres of arable land dropped from 6.8 in 1991 to 4.8 in 2001 and further to 4.5 in 2005⁵, while food imports as a percentage of total imports fell from about 18.2 per cent in 2001 to about 16.3 per cent in 2009.

3 Sourced from the World Development Indicators Database, World Bank (<http://wdi.worldbank.org>).

4 Sourced from the World Development Indicators Database, World Bank (<http://wdi.worldbank.org>).

5 Sourced from the World Development Indicators Database, World Bank (<http://wdi.worldbank.org>).

A sizable portion of land in Ghana has experienced soil degradation since the 1960s due to over dependence on agricultural, timber and mineral resources. Soil has been degraded by damage to its structure, depletion of nutrients and increased susceptibility to erosion largely caused by the increasing use of chemicals and inappropriate equipment and technologies, commercial mono-specific plantations and inefficient irrigation systems. Degradation due to agriculture was estimated to have cost 1.57 per cent of the GDP in 2005 (World Bank et. al, 2006). Prolonged land degradation in northern Ghana is intensifying desertification, which has serious links to poverty, migration and food security.

A relatively large portion of Ghana, along the equatorial zone used to be under forest cover. Unfortunately, a large swathe of it has been lost to deforestation. It is estimated that Ghana lost an average of 125,400 hectares or 1.68 per cent of forest cover annually between 1990 and 2010. Over that period the country lost some 2,508,000 hectares, or 33.7 per cent of its forest cover. The Food and Agricultural Organization has also documented the gradual decline in Ghana's total forest area. This area has been decreasing, from 9,600('000) hectares in 1961 to 7,448('000) hectares in 1990, 6,094 ('000) hectares in 2000, 5,517('000) hectares in 2005 and 4,940 ('000) hectares in 2010. At this rate, it will be impossible to meet the target of increasing the proportion of land area covered by forests.

Ghana has rich and varied biological resources that form the basis of its social and economic systems. The humid tropical forests that form part of the equatorial belt are among the most productive ecosystems in the world. Unfortunately, Ghana's biodiversity is under threat from the loss of natural habitat and species or subspecies, and the lack of recognition of indigenous knowledge and property rights. The causes of habitat loss include: human population growth and the resulting demand for space, food and other resources; widespread poverty; dependence on natural resources; and economic pressures to increase exports, particularly agricultural produce, timber and mineral products. The loss of species is mainly a result of the loss of natural habitats, illegal hunting for food, medicinal or commercial use and national and international trade (UNEP, 2002).

In 2010, 118 plant and 16 mammal species were considered threatened. A lot needs to be done to reduce the loss of biodiversity, if Ghana is to attain the JPOI outcome that enjoins countries to significantly cut the current rate at which biological diversity is being lost by 2010.

Ghana is endowed with abundant freshwater resources such as rivers, lakes, wetlands and groundwater. In addition, the country's coastal zone supports diverse habitats and resources, ranging from mangroves to rocky shores, sandy beaches, deltas, estuaries, coastal wetlands, coral reefs and lagoons. These ecosystems contribute significantly to the livelihoods of coastal communities and to national economies through fishing, agricultural activities, tourism, oil and mineral mining and infrastructure development. They also have intrinsic value because they help stabilize the shoreline, enrich the beach, generate nutrients, and moderate pollution. Unfortunately, the water bodies are being polluted owing to poor waste management, agricultural and industrial discharges and mining, especially on the small scale. The Ankobra, Pra, Birim and Offin rivers are heavily polluted and coloured. In addition to the pollution, most rivers are drying up and shrinking owing to deforestation and farming along their banks.

Thanks to their diverse and attractive resources Ghana's coastal areas are experiencing rapid population. According to World Bank estimates, by 2025 the coastal region from Accra to the Niger Delta could be an unbroken chain of cities along 5,000 kilometres of coastline, with a total population of 50 million. Unfortunately poor waste management, agricultural and industrial discharges are damaging these water bodies and coastal and marine environments.

Overall the country has not done very well in sustaining the environment, although the situation appears to be improving. Yale University confirms this in its 2010 Environmental Performance Index that ranks 163 countries on 25 performance indicators, tracked across ten policy categories covering environmental public health and ecosystem vitality. Ghana scored 51.3 points and was ranked 109 in 2010. In 2012 the country improved its ranking to 91 out of the 132 countries assessed, scoring 47.5 points.

6 <http://rainforests.mongabay.com/deforestation/2000/Ghana.htm#01-cover>.

Concentration on primary production, especially oil and minerals, compounded by weak enforcement of environmental regulations, poor value addition, poverty and the country's limited bargaining power is leading to serious environmental pollution.

In terms of the social and environmental imperative, current policies and strategies in the GSGDA will affect the promotion of IGG and the transition to GE. These include ensuring a fair and balanced allocation of national resources across gender and income groups and regions, the development of social infrastructure in poor rural and urban communities, the empowerment of the rural and poor population by reducing structural poverty, and social exclusion, protection of the environment, and the mitigation of the effects of and adaptation to climate change.

2.3 Green economy and inclusive green growth in the context of Ghana

According to MESTI/UNDP (2012) Ghana perceives a green economy as: one that leads to pro-poor growth and creates decent employment for the majority of the people; ensures good urban management and sustainable consumption and production; and leads to low-carbon emission and effectively integrates the three dimensions of sustainable development, among others. This perception on green economy is in line with UNEP's working definition: "A system of economic activities related to the production, distribution and consumption of goods and services that result in improved human wellbeing over the long term, while not exposing future generations to significant environmental risks and ecological scarcities". Defined in this way the green economy is an omnibus term like sustainable development and comprises policies and instruments to exploit natural resources in support of sustainable development goals. In brief, the green economy is not a substitute for sustainable development, but rather a way of realizing it.

Ghana has implemented many policies over the years that have a bearing on the transition to a green economy. This is consistent with a step-wise approach to the green economy, with a focus on harnessing opportunities for IGG in selected sectors of the economy. In the past two years, with the support of UNEP, the country has been discussing the transition to a green economy in areas of green budgeting; and inclusive green growth projects have been implemented or are being implemented in agriculture, energy, forests, land and water, transport and to a lesser extent in urban environmental management and infrastructure—roads, buildings and industrial installations, finance, manufacturing and tourism.

Ghana's current engagements in inclusive green growth projects, and its ultimate quest to achieve a green economy, stem from the fact that IGG as a step towards GE is the engine for sustained development and can create sustainable employment to speed up poverty reduction. That is because such projects can help attain desired economic and social growth in several areas through improved efficiency in resource use by: investing in cleaner production technologies; using cleaner energy technologies and improving access to energy services; increasing food security through the use of more sustainable agricultural methods, and easing access to emerging new markets for green goods and services. From the country's perspective, transformation to a green economy means having a sustainable recourse for policy direction aimed at pursuing best practices in IGG in specific sectors such as energy, transport, agriculture, water, forestry, and urban management, among others.

3. Inclusive green growth: good practices in selected sectors

3.1 Country framework and mechanisms to promote inclusive green growth

Since 1996, the Government of Ghana has re-oriented all development policies around sustainable development—economic, social and environmental dimensions—more specifically around sustained poverty reduction, which is one of the core focuses of IGG. Attention to inclusive GE has also gained momentum in recent years at the highest political level and across sectors. Practical efforts are underway to facilitate effective the integration of GE into the next development planning agenda and programme.

Ghana recognizes the importance of addressing green growth, including climate and environmental challenges proactively, to ensure sustainable and inclusive economic development. To this end, the Government of Ghana has pledged to promote sustainable and renewable energy. Ghana is one of the first countries to partner with the UN initiative “Sustainable Energy for All”, which seeks to transform the world’s energy system by 2030 and, thereby ensure a more sustainable future. In addition, Ghana has developed an energy strategy, setting a goal to ensure that by 2020, 10 per cent of the energy it generates nationally will be renewable. To reach this purpose, Ghana’s parliament in 2011 passed the Renewable Energy Act 832, providing the legal and regulatory framework necessary for enhancing and expanding the country’s renewable energy sector.⁷

There are strategies and dimensions of GE that have been articulated in Ghana’s Shared Growth and Development Agenda- the current medium-term development blueprint for Ghana (2010-2013). For instance, climate change and the environment in general were mainstreamed into the GSGDA, which has many policy measures and actions in key sectors. This could have a positive effect on inclusive GE. The mainstreaming of climate change in the GSGDA is evidence of the country’s efforts to ensure low-carbon development, an important component of GE. The key policy measures to mainstream climate change in the GSGDA include: identifying and enhancing early warning systems; enhancing the national capacity to adapt to climate change through improved land-use management; and adaptation to climate change through enhanced research and awareness creation. Ghana has developed a National Climate Change Policy Framework (NCCPF) as part of the work plan of the cross-sectoral National Climate Change Committee, which is hosted by MEST. The sole aim of NCCPF is to ensure a climate resilient and compatible economy, while supporting sustainable development and equitable low-carbon economic growth for Ghana.

The NCCPF is a key contribution to the strategic objective of the GSGDA: to foster high and equitable levels of growth towards the middle-income status. It echoes many of the key themes set out in the Agenda, including the need for equitable development, coordination and harmonization. Indeed the development of the NCCPF, based on consultation and engagement, was designed to ensure its full integration into Ghana’s main national, regional and district planning processes.

Being a new development paradigm, the GE concept raises pertinent concerns and issues that need to be discussed and addressed. For this reason it is imperative to encourage a national dialogue on the concept to ensure buy-in and ownership across the board in Ghanaian society. To this purpose a national workshop was convened to appraise policymakers and development partners of the key Rio+20 outcomes and the implications for Ghana, mobilize political support for needed follow-up actions and launch stakeholder discussions on the GE.

⁷ Source-<http://um.dk/en/~media/UM/English-site/Documents/Danida/AboutDanida/Danida%20transparency/Consultations/Del%201%202013/Green%20Growth%20in%20Ghana.pdf>.

Following the recommendations from the workshop, an expert group meeting involving senior officials of MDAs and civil society organizations was organized to provide inputs to help develop a road map for GE in Ghana. As recommended by the meeting, a follow-up workshop was organized for key policy makers from NDPC, MoFEP, MOFA, EPA, among others, to discuss how to mainstream GE in the country's next development plan, scheduled to start from 2014. The workshop reached a consensus that a GE strategy paper should be developed to guide the implementation of the GE agenda. The meeting produced a road map, presented as Appendix 1, for mainstreaming GE in the next development plan.

The NDPC is the constitutional body created by the National Development Planning Commission Act, 1994 (Act 479) to advise the president of Ghana on national development planning policy and strategy. Since its establishment, the Commission has been formulating development plans for the nation. The First Medium Term Development Plan, carved out of Vision 2020, was implemented from 1996 to 2000. Vision 2020 was discontinued in 2000 owing to macroeconomic imbalances and substituted by the World Bank /International Monetary Fund-sponsored Interim Poverty Reduction Strategy Paper (IPRSP) (2000-2002), Ghana Poverty Reduction Strategy I (GPRS I) (2003-2005), Growth and Poverty Reduction Strategy Paper (GPRS II) (2006-2009) and currently the GSGDA, which is the national development blueprint for 2010-2013.

Shifting from the conventional economy that Ghana has today to a GE requires a look at win-win, low-cost short-term IGG opportunities and policies/programmes with the aim of assessing whether Ghana's transition to a GE is warranted. As a first step, Ghana has undertaken a scoping study that assesses the areas where it has comparative advantage. Further, plans are being put in place to undertake a cost-benefit analysis of a green growth path, using the country's present conventional system and various assumptions and scenarios. The idea is to ascertain if a green growth path will benefit the country more than the conventional system and, consequently, to help the Government to make informed decisions on the transition to green economy.

The scoping study on GE identified the key sectors where Ghana has comparative advantage for IGG and for greening its economy. The study discussed the consequences of existing policies governing those sectors as well as recommendations on possible fiscal policy instruments that can steer their greening. Regarding the key sectors with comparative advantage, the scoping study identified agriculture (cocoa and fisheries), land use (forestry and logging), energy and waste (electricity and water and sewerage) for IGG and for greening the Ghanaian economy. Based on a model framework that considered different scenarios to assess the impact of the green economy on Ghana's key sectors, the study concluded that moving towards a green economy could help achieve sustainable development and reduce poverty.

The study recommended a reallocation of public and private investments, with appropriate policy reforms and enabling conditions to build up or enhance Ghana's natural capital, such as forests, water, and soil and fish stocks, which are particularly important for the poor. The study stressed the importance of regulations, standards and targets in providing direction. It also emphasized the need to manage enabling conditions and provide adequate finance for IGG and the successful transitioning to a green economy. Taxes and other market-based instruments can be used to stimulate the necessary investment and innovation for funding the transition through IGG.

Besides GPRS II (2006-2009) and currently the GSGDA (the national development blueprint for 2010-2013), several other policies, strategies, plans, legislative instruments and laws have been instituted that have implications for IGG. These include the:

- Renewable Energy Act 832 (2011);
- Bioenergy policy, Strategic National Energy Plan (2006-2020);
- Energy Generation Master Plan (2012-2026);
- Ghana Energy Sector Strategy and Development Plan (2010);

- National Waste Management Policy and Implementation Plan;
- National Environmental Sanitation Strategy/policy and Action Plan;
- Feed-in Tariff, Agroforestry Policy, Food and Agriculture Sector Development Policy (FASDEP II);
- Medium-Term Agriculture Sector Investment Plan;
- National Transport Policy;
- Urban Transport Policy;
- Environmental Sanitation Policy;
- National Environmental Sanitation Strategy and Action Plan;
- Strategic Environmental Sanitation Investment Plan;
- National Wood fuel Conservation Policy; and
- The National Electrification Scheme Master Plan (2011-2020), among others.

Appendix 2 shows the main national institutions responsible for IGG policies and programmes and for mainstreaming GE into national development plans.

In addition the Government has recognized that climate change poses new challenges to Ghana's present capacity, and that it is imperative for people and institutions to respond in new ways. The Government is committed to addressing national capacity gaps, but faces continued challenges related to institutional capacity and interaction. Given the broad impact of climate change, the Government has stepped up efforts to build capacity across many sectors, including the private sector, the media, non-governmental organizations and communities.

In the next sections this report discusses case studies on IGG programmes and projects in three key sectors of interest to Ghana: agriculture and land use management; ecosystem goods and services; and energy. It focuses on the design and implementation, expected/realized outcomes and impacts, cross-cutting issues, sustainability, replicability and lessons learned.

3.2 Agriculture and land use management

While its contribution to the economy has been decreasing, the agricultural sector is considered as the main sector that holds the key to Ghana's growth, development and transformation. In spite of its declining importance, the agriculture sector makes a substantial contribution to GDP, meeting around 70 per cent of the nation's food needs, employing over 40 per cent of the active population and making up about 60 per cent of export earnings. The sector employs mainly smallholders (with three hectares or smaller parcels of land), who account for more than 70 per cent of agricultural farms (Chamberlin, 2007) and contributes significantly to foreign exchange earnings. By supporting about 70-80 per cent of the total rural population, the majority of whom are extremely poor, agriculture is directly or indirectly the mainstay of rural people.

Owing to its importance, agriculture has been identified as a key sector for greening the Ghanaian economy. However, because of its subsistence mode of production and poor farming practices, such as 'slash and burn', activities in the sector have caused land degradation, soil quality depletion and the loss of biodiversity, food insufficiency and consequently food insecurity. By adopting green practices the agricultural sector is expected to sustain economic growth and thereby foster IGG. Current policies to improve sustainable agriculture and land use include the formulation of the Accelerated Agricultural Growth and Development Strategy whose aim is to increase the sector's growth in a sustainable manner, and the subsequent Food and Agriculture Sector Development Policy II (FASDEP II). FASDEP II provides the basis for the development of a medium-term agriculture investment programme that provides the framework for investment in agriculture. In addition the MLNR is implementing the Land

Administration Project to streamline the issuance of land titles and certifications, inter alia, to safeguard tenure of tenant farmers and encourage investments.

In the agricultural sector, three case studies of inclusive green growth that can affect the transition to the GE were identified as follows:

- ✓ Sustainable land and water management project;
- ✓ Value chain development project (Roots and Tubers Improvement Marketing Project);
- ✓ Programme for the promotion of perennial crops.

Case 1: Ghana Sustainable Land and Water Management

The Ghana Sustainable Land and Water Management Project is a five-year project (2011 to 2015) financed by the Global Environmental Facility through a grant of US\$ 8.15 million to the Government of Ghana. It is a comprehensive approach to sustainable land and watershed management that combines soft and hard investments at the community level, including maintenance of ecological infrastructure. Eventually its planning activities should be integrated into a much larger programme of water and flood management infrastructure across the Northern Savannah eco-agricultural zone. The project comprises three main components: capacity building for integrated spatial planning, water and land management and project management and coordination.

Following the devastating floods in 2007, 2008 and 2009, Ghana's parliament approved the Sustainable Development Initiative for the Northern Savannah as an integrated way of closing the economic growth gap between the north and the rest of Ghana, while increasing the northern regions' resilience to natural hazards and climate change. The Strategy is based on a win-win vision for the environment and regional economy, turning floodwaters into a productive asset by investing in flood control and irrigation while exploiting green drivers of growth compatible with improved watershed management.

The main natural resources management issues in Ghana's Northern Savannah include the loss of vegetation cover and land degradation. This has mainly resulted from inappropriate farming practices and other contributing factors, such as a poorly developed market system that does not price exploited natural resources at their real economic value, which eases access to dwindling but cheap natural resources. It is also as a result of: inadequate the involvement of key stakeholders, including local communities, in natural resource management; weak institutional capacity in the wildlife sector; and lack of inter-agency coordination in planning and monitoring natural resource use, especially at the district and community levels.

Major forms of land degradation include soil erosion, desertification and acidification. Large tracts of land have been destroyed by water erosion. In the Northern Savannah the environmental and economic impact of land degradation includes a decline in crop yield, vegetation cover and in the land's resilience to climate variability.

As such, GSLWM seeks to demonstrate improved sustainable land and water management practices with the aim of reducing land degradation, enhancing maintenance of biodiversity in selected micro watersheds and strengthening spatial planning so as to identify related watershed investments in the Northern Savannah region. The project provides the basis for planning major investments in water management infrastructure in the north. It also identifies complementary investments in other infrastructure and improved land management that will help harness the productive potential of water resources for the sustainable development of northern Ghana.

There was also capacity building whose aim was to provide integrated spatial planning tools (for mapping, analysis, monitoring and evaluation) so as to strengthen the capacity of the Savannah Accelerated Development Authority and relevant implementing agencies in decision making for water and land-related investments across the Northern Savannah regions.

The second component—water and land management—seeks to support community flood- and land-management at the micro-watershed level, including the management of agricultural land and ecological infrastructure. It is also associated with parallel labour-intensive civil-works investments in small-scale flood- and water-management infrastructure through the Social Opportunities Project. The third component—project management and coordination—is expected to support incremental project management and coordination activities. In addition to routine administration, this component seeks to finance technical assistance, operating costs and where necessary equipment. The routine administrative activities include budgeting and planning, procurement and financial management, financing the costs of annual audits, annual and quarterly progress reports, and reception of supervision missions as required by the Global Environmental Facility.

Design and implementation

In the three northern regions of Ghana (Northern, Upper East and Upper West Regions), the implementation of the GSLWM involves the adaptation of land-use systems, which, through appropriate management practices enables land users to maximize economic and social benefits from the land while maintaining or enhancing the ecological support functions of its resources. As such, the project's design and implementation integrate the three dimensions of sustainable development (economic, social and environmental).

Eight districts were selected for the implementation of the GSLWM, based on the: availability of sub-watershed areas; severity of flood risk and land degradation issues; inclusion in the Social Opportunities Project, or other investment programmes that can support similar small-scale water-management infrastructure; presence of biodiversity corridors to synergize Sustainable Land and Water Management (SLWM) activities in agricultural land and natural habitats; and existing or high potential for future investment in complementary large-scale water- and flood-management infrastructure. Project field activities focus on around 100 communities—about 80 for SLWM activities in agricultural land and 20 for Community Resource Management Area activities, with a potential between overlap between the two groups.

Inclusive green growth activities undertaken include: conservation agriculture, agroforestry, dry season gardening and river bank protection, fire management in agricultural landscapes and the development of waterholes, among others. The project is under the purview of the MESTI and the National Sustainable Land Management Committee, with the EPA supporting its implementation.

The project has in-built monitoring and evaluation and financial administration systems. Overall project monitoring and evaluation at the local level is the responsibility of the MESTI and strongly focuses on cost-effectiveness. This involves collating outputs and data from all implementing agencies for a consolidated monitoring and evaluation report as part of the annual progress reports. Some data, especially on activities and outputs, also comply with subproject agreements. The data also verify the timely provision of inputs by the district, as required by the agreements. Community members are mobilized to collect information on overall agricultural output as well as grassroots indicators of environmental improvements. District extension staff are responsible for collecting primary data on the implementation of agricultural sustainable land management subprojects. The staff collate subproject agreements and verify their implementation in the field, including adherence to required social and environmental safeguard measures, as a way of assessing the areas in which new SLWM technologies are applied. The regional Wildlife Division manages natural habitats and biodiversity in the project and is responsible for supporting and collating results of community monitoring.

Monitoring at the national level involves tracking the project's overall implementation performance, including its administration and coordination, financial management (procurement and disbursement etc.), outputs and resources. MESTI is responsible for this, with the support of a project monitoring and evaluation officer, although EPA, MOFA and the Forestry Commission are responsible for ensuring the timeliness and quality reports from their offices. MESTI is responsible for the overall financial

management responsibility. The project's use of internal structures has been acclaimed as one of the drivers of its success.

Expected/realized outcomes and impacts

The project is expected to enhance efforts to close the economic growth gap between the north and the rest of Ghana, while increasing the northern regions' resilience to natural hazards and climate change. As an inclusive green growth project, the GSLWM is expected to enable land users to maximize the economic and social benefits from the land while maintaining or enhancing the ecological support functions of the land resources.

Economic impacts

The GSLWM is to deliver a model for the effective scale-up of SLWM technologies by reducing transaction cost barriers and placing a premium on economic impact and cost-efficiency. The economic benefit from the project will indirectly accrue from improvements in soil fertility, which is expected to spur greater agricultural productivity, lowering dependence on chemical inputs and increasing returns for participating farmers who adopt SLWM technologies. Regarding the use and valorization of local technologies, about 2,000 hectares of land in selected micro-watersheds are under new SLWM technologies. The project is also expected to reduce natural hazards in the region through agroforestry and other flood control mechanisms. Irrigation and dry-season farming will reduce agriculture's dependence on rainfall, make it an all-year activity and reduce the risk of irregular precipitation. This will help increase incomes for the people in the region.

Social impacts

The GSLWM offers substantial local social benefits, including improved long-term maintenance of irrigation schemes and/or regulation of stream flows, which will help maintain or even increase the length of the growing season. In addition the project will diversify the livelihoods of the communities involved through greater opportunities in agroforestry and natural resource-based activities, which may include eco-tourism. It will provide a greater variety of natural resources, such as wood, wildlife and medicinal plants, and increase the climate resilience of livelihood systems through (i) improved soil moisture retention and water availability, (ii) livelihood diversification, and (iii) the availability of natural resources as insurance against agricultural impacts and the reduction in the risk of major bush fires that endanger property or life. Many of the activities, for example dry season farming, will generate new, additional employment.

To promote women's involvement in agricultural production and natural resources, women make up 40 per cent of the 4,000 farmers who have benefitted from improved land management under SLWM subproject agreements.

Environmental impacts

The GSLWM aims to work with communities to apply soil conservation and mixed cropping techniques and to improve the management of natural habitats and natural resources. The expected environmental benefits include enhanced terrestrial biodiversity by improving the protection of wildlife and habitats, more complex agro-ecologies and better correlation between protected areas, reduced run-off, soil erosion and the risk of desertification.

With regards to water management, the project will help improve the regulation of hydrological flows and reduce the sedimentation of watercourses. By enhancing the management of natural soil fertility and promoting integrated pest management (IPM) techniques, the project will limit the need for agricultural chemicals.

Enabling measures

Measures aimed at enabling the GSLWM to operate include a government grant from the Global Environmental Facility to directly finance the implementation of the project. The strong collaboration that the GSLWM has forged with the Savannah Accelerated Development Programme, an ongoing government programme for Ghana's northern regions, is a confirmation of effective partnerships with other programmes. Efforts to intensify community empowerment and organizational capacity building have been indispensable to the project's successful implementation. So too has been the active involvement of district assemblies through a participatory planning process.

Cross-cutting issues

The project is based on a win-win vision for the environment and regional economy of the three northern regions of Ghana. By investing in modern flood-control and irrigation technologies to turn floodwaters into a productive asset, the project sought to harness green drivers of growth that are compatible with improved watershed management. The project also promotes community empowerment and organizational capacity building, including a stronger voice in district-level decision making through participatory planning. In addition to boosting the participation of women and young people, it acknowledges their critical roles in agricultural production and natural resource management. The GSLWM is also relevant to climate-change adaptation and mitigation.

Sustainability and replicability

The project has identified and built strong collaborations with on-going government and donor programmes, such as the Savannah Accelerated Development Programme in the Northern Savanna. Given its in-built flexibility to exploit new opportunities the project will continue beyond its implementation phase. The benefits of enhancing economic activities, especially agricultural productivity, by improving land and watershed management in the selected districts of the three northern regions, will help ensure the project's sustainability.

Lessons learned

Two main lessons can be drawn from the project's implementation—better integration of the project with existing government programmes and institutions and the involvement and use of local technologies. Specifically, the project was to some extent integrated into the overall programme of the MESTI and MOFA and whenever employees worked on it they were paid allowances. In the past, such projects have had separate offices and their employees were paid higher salaries than their counterpart in the ministries, which created discord. Communities were very involved and the technologies used were local, tried and tested by the communities and found to be efficient. This made by-ins easier.

Case 2: Roots and Tubers Improvement Marketing Project (RTIMP)

The Root and Tuber Improvement and Marketing Programme is a follow-up to the Root and Tuber Improvement Programme that was implemented from 1999 to 2005. The aim of the RTIP was to develop the root and tuber subsector, notably root and tuber crop production through research and extension work. While the RTIP achieved remarkable results, there was a need for a better balance between crop production and the development of downstream activities, such as processing and marketing, to ensure that farmers reaped the full benefits of higher yields and production. The RTIMP was launched to promote good practices along the value chain from the production to the marketing of roots and tubers. The aim was to increase the price that farmers charged for their produce and thereby reduce poverty among them, one of the core concerns of the IGG.

Design and implementation

Designed to run for a period of eight years (2007-2014), the RTIMP is funded by the: International Fund for Agricultural Development (69 per cent); Ghanaian government through the MOFA (14 per cent); partner institutions, and the leasing company (14 per cent); and beneficiaries (3 per cent, in kind). Operational since November 2006, the programme was initially expected to involve 60 districts but has been expanded to cover 90 districts. It conducts integrated activities in 66 districts, while focusing exclusively on planting material multiplication and distribution in 24 additional districts. As an inclusive green growth intervention, the RTIMP integrates the three dimensions of sustainable development, although the economic and social dimensions were more pronounced than the environmental component.

The RTIMP targets asset-poor, food-insecure and labour-deficient farm households wanting to improve the productivity and quality of their cultivation of root and tuber crops for food-security and/or income generation. It also focuses on small-scale root and tuber processors, both individuals and existing groups, whose incomes are depressed by lack of access to improved technologies, equipment, skills, capital and markets. Other beneficiaries are asset-poor operators in the root and tuber commodity chains (such as informal traders and wage-workers) who have the interest and dynamism to become viable micro or small entrepreneurs. The RTIMP's goal is to enhance income and food security as a way of improving the livelihoods of poor people in rural areas. To this purpose, it enhances market relations within the root and tuber commodity chain to ensure a "pull" factor for increased production, and help create a better balance between supply and demand.

The programme's main purpose is to build a competitive market-based root and tuber commodity chain supported by relevant, effective and sustainable services that are available to poor people in rural areas. This involves sustainable enhancement of the farm level productivity of root and tuber crops (cassava, cocoyam, yam, sweet potato, persa potato) and improved root and tuber processing and marketing. The project also seeks to increase access for economically active poor people to working and investment capital by promoting new target-group specific lending instruments, organizational development, including the creation of an apex body for the root and tuber commodity chain and information dissemination, education and communication campaigns.

The project has four components: support to increased commodity chain linkages; support to increased root and tuber production; upgrading of root and tuber processing, business and marketing; and programme coordination, monitoring and evaluation.

As part of the first component, support to increased commodity chain linkages, the project will build competitive market-based and inclusive root and tuber commodity chains, supported by relevant, effective and sustainable service-delivery mechanisms that are easily accessible to poor people in rural areas. Sub-components under this component include information, education and communication linkages, connecting small producers and processors to large-scale markets, the strengthening of organizations of root and tuber farmers, processors and traders and support to root and tuber commodity chain integration and policy dialogue.

The second component—support to increased root and tuber production—is being implemented by a host of strategic partner organizations, institutions, consultants, and private investors through the District Stakeholder Fora; Business Client Fora; review workshops at various levels; exchange visits between the various actors of the commodity chains, Farmer Field Fora (FFF), visits to Good Practices Centres (GPCs); and participatory planning, implementation, monitoring and evaluation of all activities. The aim of this component is to enhance the productivity of root and tuber production by facilitating access to new, relevant and adoptable technologies. The technologies are mainly improved planting material and cultivation practices that enhance the realization of the full genetic potential of the crop by boosting crop, soil, pest and disease management. They also include the multiplication and distribution of planting material, integrated pest and disease management and improved root and tuber cultivation practices.

The goal of FFF is to improve farmers' innovation and productivity, build farmers' capacity to analyse their productive systems, identify problems, test possible solutions and eventually adopt the practices most suitable to their farming systems. A FFF group may consist of farmers and/or processors. They play an active role in initiating discussion and actions, thereby ensuring that their priority issues are addressed. To establish a FFF in a location, a participatory rural appraisal is first organized so as to interact with the farmers and become familiar with their farming practices, challenges or constraints. After discussing indigenous agricultural practices and identifying what works and what does not, the farmers are assisted in organizing practical demonstrations of possible solutions (such as improved planting material and varieties, soil fertility and integrated pest management), identified with the assistance of researchers and extension workers. The FFF members themselves identify and address the constraints and opportunities and their FFF becomes a platform for practical hands-on learning.

The third component under RTIMP—the upgrading of root and tuber processing, business and marketing and programme coordination—seeks to upgrade the rural micro and small enterprises involved in root and tuber processing by easing their access to improved technologies and to training and backstopping on business management and marketing skills. This involves identifying and promoting root and tuber technologies, establishing GPCs, providing training in business development as well as establishing and operating micro-enterprise funds (MEF).

To establish and operate an efficient and effective programme, the fourth component—monitoring and evaluation—seeks to coordinate, monitor and evaluate the programme as well as putting in place a financial management system. A programme coordinating office works with three zonal offices to coordinate the implementation of activities at the district level.

Expected/realized outcomes and impacts

The RTIMP works with a broad cross section of stakeholders to achieve maximum economic, social and environmental impacts at all stages of the root and tuber commodity chains. The projects' expected output includes:

- (i) An informed public on programme activities and processes;
- (ii) Demand-driven viable, functioning and integrated product-based root and tuber commodity chains at all levels (local, district, regional, national or international, depending on the product);
- (iii) Increased empowerment of small root and tuber farmers, processors and traders, resulting in a more equitable creation of value and distribution of benefits along the root and tuber commodity chains;
- (iv) A viable and functioning apex body of the root and tuber subsector backed by a continuously updated knowledge centre on business opportunities in the root and tuber commodity chains;
- (v) The creation of a more enabling policy environment for the development of root and tuber commodity chains;
- (vi) The establishing a network of 75 high-performing root and tuber processing units as good practice centres or demonstration units from existing processing concerns.

In addition to 19 GPCs that have been established, the project is promoting the use of 17 new, more efficient and cost-effective prototype processing pieces of equipment. Processors of root and tubers have also been organized under the project to visit the GPPCs. As part of the project's business development training component, 1,503 small-scale manufacturers have received training in good manufacturing practices and marketing. In addition relevant processing technologies have been identified and disseminated and a MEF has been established. The project has also linked up small-scale producers and processors with larger-scale users of root and tuber products.

Economic impacts

The economic impact of the RTIMP can be measured in terms of increased output and income as a result of substantial value addition at the various stages of the value chain. The project uses improved planting material and cultivation practices that optimize the realization of genetic crops' potential. This involves boosting the management of crops, soil, pests and diseases and upgrading processing facilities, which ultimately increases profits and general productivity for the farmers and the centres alike.

Under the value chain concept, the GPCs serve as the hub for all chain linkage activities and marketing points for raw cassava producers. Several cassava farmers now sell their produce at the GPCs. At the GPCs raw material supplies are now regulated to offer good prices to farmers and processors alike. At Asuogya GPC, sales volumes rose from 180 tons of gari per year before upgrading to 360 tons of gari per year after upgrading. The net profit in 2011 amounted to ₵ 34,510 (about US\$ 17,250). The GPC at Kanyitiwelle now produces 60 bags of gari per week against 10 bags of gari per week previously. The net profit in 2011 amounted to ₵ 36,990 (about US\$ 18,500). At JOSMA Agro-Industry, the use of improved stoves built by RTIMP has increased production from 14 80-kilogramme bags of gari a week to 35 bags a week. The net profit in 2011 amounted to ₵4,010 (about US\$ 2000). Farmers are benefiting, thanks to the increase in production and prices.

Social impacts

RTIMP awareness programmes and advertisements have helped educate a wide range of stakeholders in the root and tuber industry and provide them with technical information. The stakeholders along the root and tuber value chain are fully aware of potential business opportunities within the chain. The programme has supported the development of several commodity value chains in the country for smallholder farmers and processors.

FFF is an innovative approach introduced by the RTIMP as a platform for mutual learning. It has been found effective in fostering collective generation and dissemination of knowledge and learning by organizing genuinely "horizontal" exchanges between producers, researchers and extension workers. It is a participatory and interactive learning approach developed for small-scale farmers to investigate and learn the skills for integrated pest and disease/crop management practices in their fields. In 2012, 155 FFF were organized against a target of 90. The sessions are on-going and will be finalized in 2013. At the end of 2012, a total of 12,146 (5,998 males and 6,148 females) farmers benefited from the sessions.

Figure 1 Bundles of improved cassava planting material ready for distribution



Source: MOFA (2011): RTIMP Status report, 2011.

The livelihoods of farmers, processors and other chain actors around in the GPCs are being enhanced, as evidenced by positive changes in their dressing, homes, means of transport (from bicycles to motorbikes and KIA trucks) and also meeting a lot more of their social commitments. Training consultants and business advisory centres/local trainers have equipped 4,180 beneficiaries (1,559 males and 2,581 females representing 83 per cent of the project target) with business development and marketing skills, including quality packaging and labelling and the use of financial tools in all aspects of business operations, including the management of the enterprise record book.

Improved quality and volumes have allowed access to external markets. Nigerian businessmen are exporting gari from Asueyi, Ghana, to, Burkina Faso, Niger, Nigeria, the United Kingdom and the United States of America. Meanwhile, Jenefal Farms export gari to the Gambia. Given these benefits, the Medium Term Review decided to increase the number of the GPCs from 15 to 70. Additionally, training and capacity building have been carried out for partners and business advisory centres.

The GPCs are serving as focal points for linkage activities. They have an indirect impact on producers through increased demand for raw materials. They have also inspired actors along the cassava value chain and created employment in the various localities. For instance, an average of 75 people is employed around each of the 19 GPC (at least 25 males and 50 females). In total, the 19 GPCs have employed 285 people (95 males and 190 females).

Furthermore, several chain actors, such as farmers, traders and transporters, are indirectly employed as a result of concentrating their daily activities around the GPCs. The GPC facilities are linked with farmer groups who have been organized around the facility to supply raw materials for processing. Most target beneficiaries who have been trained are operating along formal business lines by adopting basic record keeping and an active attitude towards market forces, operating bank accounts, interacting with banks for loans, etc.,

Figure 2 Gari processing at Good Practice Centre at JOSMA, near Mampong-Ashanti



Source: MOFA (2011): RTIMP Status report, 2011.

Environmental impacts

The upgrading of processors at the GPCs has had a positive environmental impact. The use of fuel wood to process raw materials has declined considerably. Initially a truckload of fuel wood was used to roast two truckloads of raw materials. Thanks to improvements in processing technology, the same amount of fuel wood is now used to roast at least four truckloads of raw materials. This will help curb forest depletion and sequester carbon, a key objective of the IGG.

With regard to the cultivation of roots and tubers 150,321 tertiary farmers (90,225 men and 54,096 women), or 86.1 per cent of the targeted 174,400 farmers have received improved planting materials of recommended varieties of cassava, yam, cocoyam and sweet potato. The RTIMP has promoted processing and storage technologies through prototype testing and fabrication. It has also facilitated the acquisition of equipment and training to ensure the production of high quality products and enhance sanitation, hygiene and process flow. All this has increased productivity per hectare and indirectly reduced land clearing for agriculture.

Figure 3 Coppicing of improved cassava planting materials



Source: MOFA (2012) RTIMP Annual Report, 2012.

Of the targeted 30 new, improved and cost-effective pieces of equipment (prototype) for the processing of root and tuber crops, 24 have been made available and are being promoted for adoption. Through exposure visits to the GPCs, other processors, independently or through the Micro Enterprise Fund, have acquired some of the new technologies seen at the GPCs.

Enabling measures

The International Fund for Agricultural Development, the Ghanaian Government, MoFA, partner institutions and leasing companies have built a successful partnership with beneficiaries in financing the RTIMP. As part of the effort to create a favourable environment for the project's implementation, GPCs were used to intensify capacity building and transfer knowledge on ways to use and valorize local resources or technologies to cultivate and process roots and tubers. In addition, the RTIMP linked up small-scale producers and processors with larger-scale users of root and tuber products. This forged effective partnerships to ensure improved marketing of output along the root and tuber value chain.

Cross-cutting issues

The RTIMP contributes to the use and valorization of local resources or technologies in two ways. Under component two of the RTIMP, the project introduced and facilitated access to new, relevant and adoptable technologies for the production of roots and tubers. As part of component three, micro and small enterprises involved in processing roots and tubers were kept ungraded so that they could have access to improved technologies in the form of new, more efficient and cost-effective equipment (prototype) for processing root and tuber crops.

The RTIMP intervention focuses especially on improving the outputs, incomes and hence living standards of small-scale root and tuber farmers, processors and traders, particularly women and the youth. For instance the RTIMP helped economically active poor people gain greater access to working and investment capital in order to improve their economic well-being.

Sustainability and replicability

As a result of the effectiveness of and the success achieved in implementing the RTIMP, specific project activities have been identified for scaling up or replication. They include multiplying and distributing planting material, business development training and marketing, linking up small-scale producers and processors with larger-scale users of root and tuber products and establishing GPC, among other activities. The beneficiaries have teamed up and are prepared to support the activities largely as a result of benefits.

For the activities to be sustainable, the capacity of district and regional level MOFA staff and key implementing partners, such as business advisory centres of National Board for Small-scale Industries (NBSSI), has been built within operational districts to ensure continuous and effective supervision. District MEF committees have been institutionalized in RTIMP operational districts to ensure continuous and effective running of RTIMP financial services (MEF) beyond the implementation phase of the project.

Lessons learned

Several lessons can be learned from the project. First, the project builds on a need expressed by a previous project – RTIP. As such, it can be integrated into other projects, unlike many situations where projects are stand-alone. Secondly, the introduction of FFF under component two of the project was very instrumental to the success achieved in adopting and using new, relevant technologies introduced to farmers. By providing a platform for mutual learning, FFF very effectively fostered collective generation and dissemination of knowledge and learning. It facilitated genuine “horizontal” exchanges between producers, researchers, extension workers and distributors. The sharing of financial responsibility among stakeholders, including the Government, development partners and beneficiaries, may have strengthened their commitment and sense of ownership of the project. This enhanced risk sharing, unlike the situation in other projects where beneficiaries make no financial contribution.

The use of the GPCs as a hub for all value chain activities and as demonstration centres for clients of the RTIMP has also been instrumental in the success achieved. For instance, after visiting the GPCs on their own or through the MEF, processors adopted some of the new technologies seen at these GPCs to improve the quality of their products and make use of sustainable production techniques.

Group financing provided by participating financial institutions appear to be working well for all parties, and repayment rates are very good. An evaluation carried out during the implementation of the RTIMP indicated that selected technical service providers for commodity chain linkages were not as knowledgeable and innovative as originally thought. It is therefore important to train potential technical service providers /supply-chain facilitators before they start their assignment.

Case 3: Programme for the Promotion of Perennial Crops

Launched in August 2006, the Programme for the Promotion of Perennial Crops in Ghana was expected to end in June 2012. It builds on previous successful experiences in promoting rubber outgrower plantations in Ghana’s Western Region between 1995 and 2000. The PPPC was designed to increase the country’s income earned from rubber and palm oil exports (oil palm and copra), and help improve food self-sufficiency. It was also expected to help alleviate poverty in rural areas and sustain development by combating climate change. As a IGG project, the PPPC also sought to protect natural resources, in particular by restoring soil fertility.

Design and implementation

The core principle underlying the project’s design and implementation is a tripartite relationship between outgrower, technical operator and financial operator. The financial operator provides a long-term investment loan for the planting of the perennial crops (rubber and oil palm trees) and for the necessary maintenance investment during the immature phase. The technical operator provides essential farm inputs, technical assistance and extension support to the outgrower. Once the plantations start producing

rubber and oil palm, the technical operator purchases the produce and pays into an outgrower account held with the financial operator. This simultaneously secures the loan reimbursement because an amount is deducted from the gross sales for loan reimbursement to the financial operator. This concept, which proved to be so powerful under previous similar projects, was adopted by the MOFA under the current PPPC.

The objectives, components and targets of the PPPC were anchored in the Ghana's agricultural policy objectives, as defined by FASDEP II. There were five main policy areas of FASDEP II that were found in the PPPC, namely: contribution to national food security and food emergency preparedness; increased growth in incomes to households and to the nation; increased competitiveness and integration in domestic and international markets; sustainable management of land and environment; and science and technology applied in food and agriculture. PPPC was also set within Ghana's Growth and Poverty Reduction Strategy II for 2006 – 2009 (GPRS).

The PPPC is made up of two components namely: the Rubber Outgrowers Plantation Project III (ROPP III) in the Western Region; and the Buabin Oil Palm Outgrower Project (BOPOP), named after the area of Buabin in the Central Region, where the interventions were to take place. Funding totalling €36.65 million for ROPP III and BOPOP projects, and institutional support to MOFA was provided by:

- The French Development Agency;
- KfW Bankengruppe or Kreditanstalt für Wiederaufbau (KfW);
- The Government of Ghana;
- The Ghana Rubber Estates Limited (GREL);
- Twifo Oil palm plantation (TOPP); and
- Farmers.

Project funds were made available to the financial operators' National Investment bank (NIB) and Agricultural Development Bank (ADB) to be disbursed to farmers for farm investment and maintenance.

The MOFA was responsible for coordinating the implementation of the PPPC, while the Tree Crops Development Unit carried out the operational coordination and monitoring of the projects under MOFA's directorate of crop services. Technical coordinating units conducted the daily operations of the two production components (ROPP III and BOPOP), along with technical operators, Ghana Rubber Estates Limited (for ROPPIII) and Twifo Oil Palm Plantation (for BOPOP). GREL and TOPP provided technical assistance and extension services to the outgrowers, while their coordinating units mobilized the investment inputs and monitored planting and maintenance activities.

GREL and the financial operator, NIB, carried out the operations concerning the ROPP III component of the PPPC. GREL has put in place an outgrower unit as the project implementation unit responsible for delivering technical assistance to the outgrowers in terms of planting, maintenance and extension activities. The ROPP III was expected to plant 7,000 hectares of rubber trees between 2006 and 2010, for 1,750 outgrowers. The trees will be planted on 5,000 hectares in the Western Region for 1,250 outgrowers, while the Central Region will benefit from 2,000 hectares of rubber trees for 500 outgrowers. The average plantation size was four hectares. The initial target was revised to 7,200 hectares for 1,800 outgrowers to ensure that an additional 50 of benefitting outgrowers were women.

As the financial operator for the BOPOP Plantation, TOPP and the NIB carried BOPOP operations. Similar to ROPPIII, TOPP put in place an outgrower unit as the project implementation unit responsible for the delivery of technical assistance to the outgrowers in terms of planting, maintenance and extension activities. BOPOP was expected to plant 3,000 hectares of oil palm trees between 2006 and 2011, averaging 600 trees per year, for 500 outgrowers in the Buabin area of the Central Region. The average plantation size was six hectares. Owing to lack of labour and of access to secured land, initial resistance from potential outgrowers, and other challenges, the project's initial performance fell short of expectations. As a result, the project expanded the planting area to Jukwa, where farmers had longer experience with oil palm plantations.

Expected/realized outcomes and impacts

The initial target of the PPPC was to plant an additional 7,000 hectares of rubber for 1,750 outgrowers under the Rubber Outgrowers Plantation component of the project and 3,000 hectares of oil palm for 500 outgrowers under the BOPOP, between 2006 and 2011. Under the Rubber Outgrowers Plantation Project, 7,200 hectares of rubber have been cultivated in the Western and Central Regions. Additionally, 70 kilometres of feeder roads were constructed or rehabilitated to facilitate the supply of inputs and transportation of produce. By the beginning of the final year of implementation an impressive 7,857.4 hectares were under cultivation.

The Buabin Oil Palm Outgrower Project was initiated to promote the planting of oil-palm trees in the Central Region on the basis of an “outgrower scheme”. By the last year of implementation the project had outperformed its target by planting 3,200 hectares of oil palm for 945 farmers. BOPOP is also involved in rehabilitating 37.5 kilometres of main roads as well constructing and maintaining some 210 kilometres of farm roads in the project area to facilitate the supply of inputs and transportation of produce. To ensure its sustainability, the project was also expected to help outgrowers organize themselves into an interest or advocacy group by creating the Buabin Oil palm Outgrowers Association.

Economic impacts

The PPPC contributed to national food security and increased growth in household and national incomes. Based on stable world market prices for dry rubber of about US\$ 3 per kilogramme (as at mid-2010), the potential impact for poverty reduction was high. The total output of ROPP III plantations covering 7,850 hectares at peak mean-production levels was about 11,775 tons of dry rubber per annum, which at an average price of US\$ 2.5 per kilogramme represented an export value of US\$ 29.44 million annually. According to MOFA (2010) GREL paid a sales price to farmers for dry rubber at 64 per cent of the world market prices. This represented a gross value of US\$ 9,600 per farm of four hectares. In that period farm production costs were estimated at around US\$ 1,500 per four-hectare farm per year, resulting in a crop gross margin of close to US\$ 8,100 per annum. This was about nine times the annual mean household income of about US\$ 870 and US\$ 936 for Western and Central Regions respectively (MOFA, 2010).

With (see MOFA, 2010) world market prices for red palm oil (CPO) estimated at about US\$ 850 per ton in 2010, BOSOP was expected to play a significant role in reducing poverty in the Central Region of Ghana. The total output from the 3,000-hectare BOPOP plantations was projected at a peak mean production level of 7,200 tons CPO red palm oil. At an average price of US\$ 850 per ton, the total output represented an import substitution value of US\$ 6.12 million annually. Based on arrangements similar those applied to ROPP III, if 64 per cent of the world market price was paid to the outgrowers as a gross sales price of CPO, this amounted to US\$ 3.9 million or US\$ 4,911 per farm of 2.6 hectares. If farm production costs are estimated at around US\$ 800 per 2.6-hectare farm, this resulted in a crop gross margin of about US\$ 4,000.

Social impacts

In social terms, the beneficiaries' improved incomes had a positive effect on their lives and status. Anecdotal evidence indicates that farmers who are producing rubber (under the ROPPIII) have replaced thatched roofs with corrugated iron sheets. Some outgrowers benefiting from the project bought generators while others paid to have their homes connected to the national electricity grid. Additionally, the outgrowers greatly enhanced their knowledge and understanding of principles and the functioning of the credit facility, interest accumulation and reimbursement procedures.

Environmental impacts

Through its components, the PPPC was expected help mitigate climate change and preserve Ghana's natural resources by enhancing soil fertility. The ROPP III and BOPOP were expected to enhance carbon sequestration and the fertility of degraded soils. The various activities implemented under the components were relevant and highly likely to have the desired environmental impact. This may not have been the case for lands and soils where existing viable tree stocks and crops had been converted to rubber or oil palm plantations. Even so, the PPPC undoubtedly benefited Ghana by sequestering carbon or strengthening soil fertility.

Enabling measures

The main enabling measure under the PPPC was the tripartite relationship linking outgrower, technical operator and the financial operator. This guaranteed the project's successful implementation and, ultimately its viability and sustainability. Financing of the project was also built on a partnership between the French Development Agency, KFW, the Government of Ghana, GREL, TOPP and farmers. ROPP III and BOPOP also intensified capacity building and the transfer of knowledge in the use and valorization of local resources or technologies.

Cross-cutting issues

The PPPC promoted the use and valorization of local resources or technologies under both components of the project. Both plantations contributed to sustainable development by combating climate change and by protecting Ghana's natural resources, especially the restoration of soil fertility. As such, the implementation of ROPP III and BOPOP offered Ghana the opportunity to improve its capacity to adapt to and mitigate existing and future emissions of GHGs.

The PPPC adequately addressed the involvement of women by ensuring that at least 30 per cent of outgrowers in its rubber and oil-palm planting components were female. As for the ROPPIII, 50 additional outgrowers were included to increase the target to 1,800 outgrowers from the initial 1,750 during the project's implementation to ensure that at least 30 per cent of them were women.

Sustainability and replicability

The tripartite relationship between outgrower, technical operator and the financial operator has ensured the viability and sustainability of the PPPC project. Before the PPPC's implementation, this type of relationship had ensured the success of two projects in promoting rubber outgrower plantations in the Western Region of Ghana between 1995 and 2000. Given the earlier projects' success with rubber plantations, the BOPOP component under the PPPC was a replication. This confirmed that the core principle underlying the implementation of the PPPC could be replicated to other perennial crops in Ghana, such as coconut. Already a coconut outgrowers' promotion component has been identified under the PPPC as having the potential to be replicated and expanded. There are prospects for rubber development in the Eastern Region of Ghana to continue expanding in other parts of Ghana. The efforts to expand and replicate the outgrower schemes across Ghana will help develop export and alleviate poverty in a geographically balanced way in Ghana.

Lessons learned

Lessons can be learned from the implementation of the PPPC. The project was a good example of the vertical integration of projects, unlike in many situations where projects stand alone. For instance the ROPPIII was a replication of the previously successful implementation of the ROPPI and ROPPII. The tripartite relationship between the outgrower, the technical operator and the financial operator and clearly defined responsibility of each party under the tri-partite agreement was the main reason that this outgrower scheme succeeded in terms of its sustainability, viability and economic, social and environmental impact. Current efforts to expand and replicate the outgrower scheme across the country clearly indicate Ghana's readiness to spread good practices and lessons learned and thereby nurture IGG activities.

Overachievement of ROPP III targets led to funding deficits, which nearly jeopardized technical operator-outgrower relations, and consequently the sale of produce and loan reimbursement. This was because the tri-partite agreements signed by the technical operator (GREL), financial operator (NIB) and the outgrowers (farmers) did not take into account the over-achievement of the agreed targets, meaning that the PPPC had paid no extra funding. However legally, GREL and NIB were committed to the farmers for financing the planting, investment maintenance and loan, with or without financial coverage from PPPC. In future, the project's budget should take into account the possibility of outgrowers over-achieving set targets.

With regards to the transfer of technical knowledge and expertise, the “impromptu” interventions used were not efficient. The technical operator provides extension services through meetings for farmer groups, mostly in the farmers’ communities. The group method makes it possible to reach many farmers simultaneously, rendering it cost effective. The local dialect is used as the medium of instruction to ensure that farmers fully understand the messages and can contribute to deliberations. The technical operator does follow-ups on an impromptu basis, but this was not effective because the farmers were often absent during the technical follow-up. When farmers are not present at follow-up visits, it is impossible to have face-to-face meetings, educational interactions, reinforcements of acquired knowledge and direct instruction for possible necessary corrections. In future when the outgrower scheme is being replicated, the transfer of technical knowledge and expertise should rely on a more educational extension approach that puts more emphasis on the farmer and education.

3.3 Ecosystem goods and services (forestry)

Ecologically, Ghana is divided into a high-forest zone in the south, accounting for about a third of the land area (8 million hectares), a savannah zone (14.7 million hectares) mostly in the north, and a transition zone (1.1 million hectares). Ghana has a total land area of 23.9 million hectares. In terms of land use, arable lands represent 17.54 per cent, permanent crops take up 9.22 per cent while other activities occupy 73.24 per cent of the land surface. According to ISSER (2012), while there is paucity of data on all of the country's biological resources, 2,974 indigenous plant species have been documented, along with 504 species of fish, 728 varieties of birds, 225 types of mammals, and 221 species of amphibians and reptiles.

Ghana's forestry and logging sub-sector (which falls under the scope of the agriculture sector) contributes about four per cent of the agricultural sector's total GDP. Ghana's forests and wildlife endowments continue to contribute to its social and economic developments. This is in spite of the high rates of deforestation and forest degradation, the low value added to the processing of timber, unexplored potential in eco-tourism and limited effort to harness civil society's contribution to management decision-making. Ghana has 16 legally constituted wildlife reserves, covering about five per cent of its total land surface area. Its forestry resources have long underpinned formal and informal employment opportunities in the country, and provide a livelihood for a significant number of rural dwellers. From the forests, logs are produced for export, domestic mechanical wood industries and building. Wood is used for domestic fuel either in its natural state, or after being transformed into charcoal. Forests are also the source of wild nuts, plants and animals, gathered for medicinal use and for domestic consumption and commercial purposes.

According to the MLNR (2012), Ghana's forest resources are being depleted at an alarming rate. From the country's original forest cover of 8.2 million hectares at the beginning of the 20th century, only an estimated 1.6 million hectares remain. The deforestation rate is 2.0 per cent, leading to an annual loss of around 135,000 hectares. The other problem in Ghana is gradual degradation, which is incremental rather than dramatic. The Reducing Emissions from Deforestation and Forest Degradation Plus (REDD+) Readiness Proposal for Ghana (2010) identifies the primary causes of deforestation and degradation as follows: agricultural expansion (50 per cent); wood harvesting (35 per cent); urban sprawl and infrastructure development (10 per cent); and mining and mineral exploitation (5 per cent). The rapid expansion of land under cocoa cultivation, especially in the forest areas of the Western Region, illustrates the alarming depletion of Ghana's forest reserves. The shift from traditional, shaded, to the open cultivation of cocoa has resulted in the loss of forest cover and decline in carbon stocks in the agricultural landscape.

The Government is committed to tackling deforestation and forest degradation, especially as part of Ghana's REDD+ strategy to deal with climate change. The development and implementation of the revised Forest and Wildlife Policy (2011), and other on-going processes, such as the development of the Forest Investment Plan are concrete examples of efforts to tackle deforestation in Ghana. The Forest Investment Plan seeks to address the underlying causes of deforestation and catalyse transformational change by providing upfront investment to support the implementation of the REDD+ strategy, and generate information and experience for policy and regulatory changes.

The revised Forest and Wildlife policy places emphasis on non-consumptive values of the forest and creates a balance between timber production and marketing, in particular to satisfy domestic demand for wood. The policy seeks to: (i) consolidate good governance through accountability and transparency; (ii) enhance the active participation of communities and land owners in resource management; (iii) develop small and medium forest and wildlife enterprises as a means of creating jobs for poor people in rural and urban areas; (iv) increase biodiversity conservation and ecotourism development; (v) increase government commitment to the restoration of degraded landscape through massive plantation development schemes; (vi) promote sustainable management of the savannah woodland; (vii) improve research and the application of modern and scientific technology in resource management; (viii) develop climate change adaptation and mitigation measures, and; (ix) secure sustainable financing for the forest and wildlife sector.

These policy measures have a direct impact on Ghana's efforts to guarantee IGG and a transition into a GE. A case study, the National Forest Plantation Development Programme, conducted under the purview of the forestry sector, demonstrates good practices for IGG and has implications for the transition to a GE.

Case 4: National Forest Plantation Development Programme

Largely implemented in degraded forest reserves in the past, the National Forest Plantation Development Programme was re-launched in 2010 and expanded to cover private lands outside forest reserves under the Expanded Plantation Programme. This programme was meant to benefit most MMDAs with degraded forest reserves by creating job opportunities through forest plantation development.

Design and implementation

The overall goal of the NFPDP was to: develop a sustainable resource base to satisfy future demand for industrial timber and enhance environmental quality, thereby relieving the pressure on natural forests; and accelerate the greening of the Ghanaian economy.

The specific objectives of the NFPDP are to:

- Restore the forest cover of degraded forest lands;
- Generate employment as a means to reduce rural poverty;
- Improve environmental quality and provide an opportunity for the country to tap the emerging benefits of the climate change market for carbon sequestration;
- Reduce the wood deficit in the country;
- Enhance the production of food crops and contribute to food security in the country.

The NFPDP has been implemented within the scope of the Modified Taungya System, the Government Plantation Development Programme, the Community Forest Management Project, private commercial plantation developers and the model plantation systems. The programme's main stakeholders are the MLNR, Forestry Commission, private contractors/farmers and MMDAs.

Under the Modified Taungya System, the Forest Services Division, in partnership with farmers, established plantations on degraded forest reserves. The Forestry Services Division was responsible for providing technical direction, surveying and demarcating degraded forest reserve lands and supplying pegs and

seedling. For their part, farmers provided all the labour inputs in the form of site preparation, pegging, planting, and maintenance and protection against fires. The farmers are permitted to cultivate their own food crops, which are inter-planted with tree crops. Additionally, the farmers have a 40-per cent share in the returns from the investment. The rest is shared between the Government (40 per cent), the landowner (15 per cent) and the community (5 per cent). The Community Forest Management Project, which was funded with a loan from the African Development Bank, adopted the Modified Taungya System model.

The Government Plantation Development Programme utilized hired labour and contract supervisors to establish industrial plantations. Plantation workers were hired and paid a monthly allowance to establish and maintain plantations, while plantation supervisors received a one-year renewable employment contract to supervise the workers and offer technical direction. The Forestry Services Division exercised general oversight and monitored field activities to ensure compliance with quality standards for plantation establishment. This strategy was funded through the benefits targeting Highly Indebted Poor Countries. Under this scheme the Government owns the plantations developed, along with the respective landowners, who are also entitled to royalty payments.

The private commercial plantation developers and the model plantation systems involve the Forestry Commission, which releases degraded forest reserve lands to private entities after vetting and endorsing their reforestation/ business plans. Forty-nine private entities signed land lease and benefit-sharing agreements with the Forestry Commission. The Forestry Services Division makes periodic field visits to monitor the private developers' operations so as to ensure compliance with the approved reforestation plans. The private investor earns 90 per cent of the total proceeds from the plantation while the Forestry Commission, landowner and community earn 2, 6 and 2 per cent respectively.

Expected/realized outcomes and impacts

Based on the various components and the collective involvement of the main stakeholders, the NFPDP was expected to make maximum economic, social and environmental impacts, especially within MMDAs that have degraded forest reserves.

Economic impact

As noted earlier, the forest plantation programme has created a lot of direct and indirect jobs and income for rural people, many of them poor. The project's agro-forestry practices have helped participants benefit from their ordinary crops in addition to the forest, which acts as long-term income security for rural people. Some of the Community Forest Management Projects include other income-generation activities that are very beneficial to poor people. Education on forest management and agro-forestry practices has also helped farmers increase their production.

Social impacts

The NFPDP's social impact mainly concerns job creation, which is expected to help reduce rural poverty and income inequalities. Job opportunities were created in 150 MMDAs. At the end of 2011, the programme had helped create a total of 17,200 full-time jobs and 6,110 temporary or seasonal jobs country-wide. Messrs Zoil and Ecotech Services Limited employed 11,512 workers, to create and maintain plantations under the Expanded Plantation Programme. A further 1,688 were engaged in producing seedlings under the Programme, while seedling suppliers hired 110 transporters (drivers and loaders), also under the Programme.

Furthermore private plantation developers hired an estimated 4,000 workers to create plantations and maintain existing ones within degraded forest reserves (mainly in Ashanti and Brong-Ahafo). The maintenance of 5,657.34 hectares of plantations established between 2007 and 2009 under the Government Plantation Development Programme commenced in November. This generated an estimated 6,000 temporary or seasonal jobs within forest reserves in the country's ten regions.

Environmental impacts

The conversion of forest for agriculture and other purposes plays a key role in the decline in the forests' capacity to curb carbon dioxide emissions. This programme is expected to bring about environmental benefits by improving the forests' capacity to curb emissions. It will facilitate the protection of soils and watersheds, as well as that of wildlife and habitats. At the end of 2011, the NFPDP had established 166,499 hectares of forest plantation, while 27,380.60 hectares of degraded forest lands had been established under the Expanded Plantation Programme. In 2011, private developers undertaking commercial plantation development within degraded forest reserves established a total of 5,151.700 hectares of forest plantation. Since 2002, the National Forest Plantations Development Programme has helped establish over 135,000 hectares of plantations. All these initiatives will bring about environmental benefits through carbon sequestration.

Enabling measures

Effective collaboration between the MLNR, Forestry Commission, private contractors/farmers and MMDAs, under the various components of the NFPDP, played a key role in its implementation. Private contractors and farmers earned a significant portion of the returns from investments in the project, which in particular instilled a sense of ownership in them. The signing of benefit-sharing agreements was intended to instil in the private developers and farmers a sense of responsibility in carrying out the maintenance of established plantation stands.

Cross-cutting issues

Key cross-cutting issues addressed by the project include the creation of employment for young people and women. The projects under the various components are clearly IGG activities as they target poor farmers in rural areas and unemployed youth. For instance under the Modified Taungya System component, poor food crop farmers are permitted to cultivate their food crops, which are inter-planted with tree crops. In addition to the food crops harvested, farmers have about 40 per cent share in the returns from the economic tree crops. The NFPDP has created over 20,000 jobs in rural areas under its various components, which will help reduce rural poverty.

The project has direct links with climate change, given that one of its main aims is to improve Ghana's capacity to combat deforestation and global warming. This will improve environmental quality and help Ghana to tap into the emerging benefits from the climate change market for carbon sequestration. As such, the project's farming methods employed local technologies that have been scientifically tested and proven.

Sustainability and replicability

NFPDP activities will continue beyond the initial implementation phase because strategies have been put in place to ensure that benefits continue to accrue over time. Under the project, community groups are expected to sign benefit-sharing agreements to make them responsible for ensuring the maintenance of established plantation stands. Community members are therefore keen to maintain the projects to ensure sustainability.

Lessons learned

One major lesson that can be learned from this project is identifying and assessing risks and if possible, uncertainties in the project, and putting in place insurance mechanisms or safeguards to reduce such risks and uncertainties. In the northern part of Ghana, wildfires posed a major risk that could have destroyed established plantations and planted seedlings. However, the design phase of the project did not take the risk fully into consideration. This is illustrated by the fact that 2,200 hectares of plantations

were affected by wildfire in 2011. In addition, some private commercial plantations within forest reserves were reportedly destroyed by wildfire, especially Asubima and Kwamisa Forest Reserves in the Offinso Forest District. Under the fire protection strategy of the expanded programme, remedial action taken to address the wildfire risk included sensitization and awareness creation, the construction of fire rides and maintenance and regular fire patrolling during the dry season.

3.4 Energy

According to ISSER (2012), Ghana's energy subsector is currently the leading contributor of GHG emissions (without land use modification and forestry). In 1990, energy industries contributed about 4 per cent of all GHG emissions. This increased to about 26 per cent in 2006. In addition, GHG emissions from other sectors, specifically the generation of electricity within the energy sector, constituted about 34 per cent (without land use modification and forestry) in 1990, while in 2006 its contribution decreased to about 30 per cent.

The development and management of the energy sector in Ghana is guided by the 2010 National Energy Policy, which primarily seeks to create an "energy economy" that provides secure, reliable and affordable energy for all sectors of the economy. Among other goals, the National Energy Policy seeks to increase the installed power generation capacity from the current 2,000 MW to 5,000 megawatts (MW) by 2015, and to increase access to electricity (by households and industries) from the current 66 per cent to universal access by 2020.

In addition, under the power subsector, the National Energy Policy recognizes the importance of renewable energy, especially solar energy, mini hydro and wind energy, among others, in increasing universal access to electricity by 2020. The target is to increase the share of renewable energy in total energy generation to 10 per cent by 2020. This is expected to reduce fossil-fuel use and GHG emissions, one of the key components of IGG.

The Renewable Energy ACT 832 was passed in 2011 in a bid to drive the energy sector's green agenda and support the policy on renewable energy. Several programmes and projects have been carried out in line with the implementation of the Act. They include a ban on the importation of used and inefficient fridges and air conditioners, the rating of electrical appliances, a shift from the use of incandescent lamps to CFLs, and the implementation of refrigeration rebate schemes, among others. Other policy interventions being implemented to enhance the greening of the power sector include enforcing the feed-in-tariff policy, establishing the Grid Renewal Energy Fund and offering subsidies for households purchasing renewable energy technologies.

This section focuses on three case studies or good practices in the energy sector that have an impact on the transition to green economy, namely:

- The Ghana Energy Development and Access Project;
- The replacement of incandescent bulbs with CFLs;
- Energy efficiency improvements through the installation of capacitor banks.

Case 5: Ghana Energy Development and Access Project

GEDAP was established to improve the operational efficiency of the electricity distribution system in Ghana and the population's access to electricity. It will support Ghana's transition to an IGG economy by promoting a low-carbon economy through reductions in GHG. GEDAP is a multi-donor funded project involving the World Bank-International Development Agency (IDA), Global Environmental Facility, the African Development Bank, Global Partnership on Output-based Aid, the Africa Catalytic Growth Fund, the Swiss Agency for Development and Cooperation (SECO), the Government of Ghana, Electricity Corporation of Ghana and the private sector.

Design and implementation

The project is being implemented collectively by the Volta River Authority / Northern Electricity Department, the Ghana Grid Company, the Electricity Company of Ghana, Energy Commission, the Public Utility Regulatory Commission, EPA and the ARB Apex Bank. The Ministry of Energy acts as the coordinating agency, monitoring and evaluating the project to ensure the achievement of its and adherence to environmental and social management plans.

The project has four main components:

- The sector and institutional development component, which through technical assistance, capacity building and studies strengthens the capacity of key institutions involved in power distribution in Ghana;
- A distribution system improvement component; it seeks to improve the electricity distribution system and upgrade the commercial and technical capacity of the Electricity Company of Ghana;
- An electricity access and renewable energy development component; its role is to support intensified use of existing electricity and distribution systems, rural electrification through grid extension, mini-grid and grid-connected renewable energy and off-grid electrification using solar PV systems; and
- The transmission and distribution system reinforcement component.

GEDAP was formulated to support the Government's vision for the energy sector as contained in GPRS II (2006-2009), "to develop an energy economy that would ensure secure and reliable supply of high quality energy services for all Ghanaian homes (both within urban and rural areas), businesses, industries and the transport sector while making significant contribution to the export earnings of the country".

GEDAP has modernized its rural electrification policy to allow grid-based electrification and off-grid alternatives to coexist and complement each other. The aim is to increase its transparency, promote private sector innovation, and prevent the programme from imposing an uncompensated financial liability on energy distribution companies. Additionally, GEDAP is pursuing renewable energy alternatives in areas not served by the national grid, using innovative credit facility mechanisms that lower the upfront cash cost of solar lighting equipment for consumers and enhance the business environment for small-scale energy entrepreneurs.

Expected/realized outcomes and impacts

The Government has put a premium on the achievement of the Millennium Development Goals for Ghana. The Goals emphasize the importance of well-developed infrastructure in facilitating economic and social growth. GEDAP's contribution to this objective is to support economic empowerment by removing infrastructure barriers to business development and job creation in Ghana's main cities and rural areas. At the same time, the project aims to accelerate access to affordable, modern energy for poor people in the rural areas.

Furthermore the Government wants to promote renewable energy alternatives in areas not served by the national grid, using innovative credit facility mechanisms that lower the upfront cash cost of solar lighting equipment for consumers and enhance the business environment for small-scale energy entrepreneurs.

The project has made some achievements. Under the grid extension and intensification and solar PV for rural electrification and household sub-component, 105,511 out of the targeted 107,677 customers have been connected to the national grid in 925 communities. Additionally 610 distribution networks have been installed or upgraded and commissioned. Five out of six 33/11kV substations have also been installed and commissioned. To reinforce the distribution network of the Electricity Company of Ghana and other distribution agencies, 563 existing grid-connected rural and peri-urban communities have been reinforced. In addition, the Kumasi Second Bulk Supply Point has been installed and over 9,000 out of 15,000 solar systems and lanterns have been installed in 11 districts.

Economic impacts

At the macro level GEDAP is expected to enhance the efficiency of electricity supply, and consequently help improve the financial viability of the energy sector. This in turn will reduce the sector's fiscal burden on the economy and encourage other social investments that will foster human development in rural Ghana. The supply system's greater efficiency reduces technical problems and ensures a more constant supply of electricity to businesses and households. At the sectoral and household levels, improved electricity supply will lead to income-generating activities that benefit the economy.

Social impacts

GEDAP is expected to close the "infrastructure gap" between rural and urban areas and help achieve the economic growth required for a substantial reduction in poverty. Electricity supply to rural people will support the development of the private informal sector by removing energy infrastructural barriers to small- and medium-scale enterprise development in rural areas. It will also spur the development of financing mechanisms for the development of energy enterprises. The impact of this on employment and incomes will be considerable. Many rural people can also extend their social and other activities once electricity is available.

Environmental impacts

Efficiency enhancing measures in the transmission and distribution of electricity will help mitigate climate change by reducing system losses, and ultimately, GHG emissions. This implies that a reduction in system losses will translate to an increase in the power made available with the same generating equipment. Efficiency-enhancing measures in the transmission and distribution sector are likely to intensify the reduction in GHG emissions, for which carbon finance may be claimed. The application of new business practices and technology will enhance energy efficiency in the electricity distribution system, making the project instrumental in containing carbon dioxide emissions. Additionally, the introduction of solar systems will indirectly help curb emissions, given that the generation of that energy by conventional means would have involved CO₂ emission.

Enabling measures

While this is primarily a multi-donor funded project, GEDAP is also financed in part by the Government of Ghana, with the Electricity Corporation of Ghana and the private sector providing counterpart funding. By supporting the development and initial implementation of a commercially oriented framework for scaling-up electricity access, GEDAP encourages private sector participation in providing electricity services. The project will also use fiscal policy instruments, such as tax waivers on renewable energy technologies imported for electricity generation, and financial support, through innovative credit facility mechanisms, to reduce the upfront cash cost of renewable energy, such as solar power to generate electricity.

Cross-cutting issues

One of the main thrusts of the GEDAP project was the promotion of low-cost technologies to increase connection volumes and sustainability. The project estimates that connection costs can be reduced by 30-40 per cent through competitive bidding procedures and low-cost technologies. Almost all the installation made was efficient and employed state-of-the-art technologies. For example, the solar PV for rural electrification and the household sub-component used very efficient panels that could withstand the local conditions. In rural areas where electricity was extended, ready-boards were installed instead of complete house wiring. This provided instant access to electricity without costly house wiring, thus enhancing sustainability.

Sustainability and replicability

The GEDAP project will support the development and initial implementation of a commercially viable framework for scaling-up electricity access and support emerging business models that engage the private sector in providing electricity services. This is a key factor for sustainability. The IDA grant will finance the capital cost of transmission and distribution investments in urban and rural areas. The sustainability of this infrastructure will depend on the quality of the operations and maintenance, as well as systems for financing their costs. The sustainability of the Electricity Company of Ghana and Volta River Authority components will primarily depend on raising net revenue per unit of electricity sales (through cost-reflective tariffs, selective load-shedding and/or fiscal support). Reducing the unit cost of supply per customer will also be crucial. In rural areas, increases in connection volume will reduce the cost per consumer and enhance sustainability. To this end, the project will promote the use of low-cost technologies, such as the installation of ready-boards rather than complete house wiring. This system provides instant access to electricity without costly house wiring.

GEDAP supports the development and initial implementation of a commercially oriented framework for scaling-up electricity access. It also supports emerging business models that engage the private sector in providing electricity services. Once these models demonstrate success, they can be replicated nationwide in Ghana

Lessons learned

Many lessons have been taken from successful rural electrification programmes in the developing world. The main lessons that have been incorporated in the development of the third generation access expansion framework under GEDAP include: (i) setting up a highly effective implementing agency solely responsible for rural electrification; (ii) placing a strong emphasis on cost recovery; (iii) ensuring that prices are high enough to make rural distribution financially sustainable for the companies involved; (iv) ensuring that subsidies encourage rather than discourage the development of the distribution business; (v) reducing initial connection charges or spreading them over a period of several years; (vi) reducing construction and operating costs; and (vii) allowing grid-based rural electrification and off-grid alternatives to coexist and complement each other. GEDAP also reviewed and incorporated experience and lessons learned from past renewable energy and Global Environmental Facility PV projects in Ghana and elsewhere.

While the project has achieved some success, the 2011 World Bank's implementation status report, indicated that Ghana's inability to put in place the necessary regulatory framework to implement the Renewable Energy Law is a challenge that is holding back private investment in renewable energy development in the country. This implies that regulations to back implementation are a very important component for the private sector in ensuring the success of projects.

Case 6: Replacement of incandescent bulbs with compact fluorescent lights

Ghana is the first African country to ban the importation of incandescent bulbs as a load reduction measure to achieve energy efficiency and promote IGG. The replacement of incandescent bulbs with CFLs and the ban on the importation of incandescent bulbs were part of the Government's measures to solve the acute energy crisis over the period August 2006 to September 2007. Under this policy the Government imported and distributed for free some six million CFLs to residential consumers in exchange for installed incandescent lamps in 2007. The objective was to reduce household expenditure on electricity, eliminate brownout and transformer overloads, and cut the domestic peak load by 200 to 220 megawatts.

Spearheaded by the Energy Commission, the project in its first three years of implementation cut the use of incandescent lamps from 58 per cent in 2007 to 3 per cent in 2009, while the penetration of CFLs increased from 20 per cent in 2007 to 79 per cent in 2009.

Design and implementation

Lighting has proved to be the largest part of the residential electricity load in Ghana. The Energy Commission in 2000 estimated that the lighting load accounted for 60–65 per cent of the total residential load in Ghana. The estimate showed that incandescent lamps were the highest consuming source of lighting in Ghanaian homes and is mostly 40–100 watt, with a short lifespan of about 1,000 hours. In its 1999 survey on energy consumed by different lamp types for interior lighting, the Energy Foundation pointed out that incandescent lamps consumed 79 per cent, while linear fluorescent lamps accounted 20 per cent of the consumption and CFL for only 1 per cent.

The Government embarked on this project to cut the domestic peak load. Six million CFLs were imported and distributed to households in exchange for installed incandescent bulbs. Additionally, duties and VAT on CFLs were removed to make the lamps affordable to all. In 2008, a legislative instrument (L.I. 1932.) was passed that prohibited the manufacture, importation and sale of incandescent lamps. The Energy Foundation spearheaded extensive public education and awareness campaigns to sensitize the public on the benefits of using CFLs and the disadvantages of incandescent lamps.

The main stakeholders involved in the project were the Energy Commission, the Electricity Company of Ghana, the Association of Ghana Industries, NED, the Ghana Association of Electrical Contractors and the Public Utility Regulatory Commission. Monitoring, verification and enforcement of the project was ensured by regular random inspection at customs offices and lighting product manufacturers or retailers in the country. To enforce compliance, a fine of 250 penalty units or a 12-month prison term was handed down to anyone who violated the standards.

Expected/realized outcomes and impacts

Before the policy was implemented, the population predominantly used CFLs, linear fluorescent lights, tungsten halogen, incandescent and high intensity discharge lights. Implementation of the policy has led to an increase in the use of CFLs, light emitting diode, efficient linear fluorescent, efficient high intensity discharge and a very minimal quantity of incandescent bulbs. Specifically, about 1.5 million linear fluorescent bulbs, 3.5 million CFL bulbs, 200,000 tungsten halogen bulbs and 1.7 million incandescent bulbs were used in most residencies in Ghana before the policy was implemented. Since then, some 5.1 million CFL bulbs, 300,000 light-emitting diode lamps, 1.8 million efficient linear fluorescent bulbs and 100,000 incandescent bulbs are in use.

In industry, before the policy's implementation some 3.2 million linear fluorescent lights, 100,000 incandescent bulbs, 900,000 CFLs and 120,000 tungsten halogen were in use. With the introduction of the policy, around 3.3 million efficient linear fluorescent bulbs, 25,000 efficient high intensity discharge lamp, and 80,000 light-emitting diode lamps are being used in industries.

As for outdoor lightening, there were about 900,000 linear fluorescent bulbs, 300,000 high intensity discharge lamps, 200,000 CFL bulbs and 50,000 tungsten halogen lamps before the policy was introduced. Since then some 800,000 efficient linear fluorescent bulbs, 200,000 efficient high-intensity discharge lamps, 50,000 light-emitting diode lamps are in use.

Economic impacts

The policy's economic benefits include a cut in the amount of electricity consumed in residencies from about 0.29 TWh to about 0.19 TWh. Likewise the policy led to a decline in industrial electricity consumption from 0.72 TWh to 0.52 TWh, and from 0.29 TWh to 0.21 TWh for outdoor lighting. According to a UNEP (2013), Country Lighting Assessment Report, the total energy saved as a result of the shift to energy-efficient lighting in residential, commercial, industrial and outdoor sectors is about 375.0 GWh in annual electricity consumption, which is comparable to the power output of three small (20MW) power plants. This is equivalent to 5.8 per cent of the total national electricity consumed and 29 per cent of electricity used for lighting, which translates to about 32.3 kilotons of crude oil. The Report also estimates that annual operating cost for all lamps, including installation, maintenance, replacement and electricity costs, have dropped from US\$ 185 million to US\$ 141.1 million. This means that about US\$ 44.8 million is saved annually, which represents a payback period of four months. As at 2009 the project was expected to save a peak load of 124MW of 172.8 Gwh, translating to US \$33.3 million per annum (based on a crude oil price of US\$ 105 per barrel). Based on a selected sample of 25 districts nationwide, the use of CFLs instead of incandescent bulbs would help households save on average GH¢ 62.00 per annum.

Social impacts

Ghanaian consumers have generally accepted the CFL technology. It offers better illumination of indoor and outdoor surroundings, while the drop in energy bills has freed up funds for other social activities. By cutting the peak load, the project helped reduce power outages. Meanwhile the free exchange of incandescent bulbs for CFLs gave Ghanaians confidence in the Government's resolve to solve the power crises, which strengthened social relations between government and the people.

Environmental impacts

The pre-policy period shows that that residences emitted 0.061 million tons of CO₂ in the country, but this was reduced to 0.0401 million tons after the implementation of the policy. Industrial emissions fell from 0.179 million tons to 0.122 million tons, while outdoor area emissions dropped from 0.063 million tons to 0.046 million tons. In general, the project is expected to generate CO₂ savings of about 112,320 tons per annum.

According to the Country Lighting Assessment by UNEP (2013), there has been a decline in the amount of mercury released when recycling incandescent and linear fluorescent lamps from 2.06 kilogrammes to 1.36 kilogrammes. This suggests that 0.7 kilogramme of mercury emissions is avoided thanks to the reduction in the use of incandescent lamps. Generally, the annual reduction in CO₂ emissions is around 90.9 kilotons, which is equivalent to removing 22.7 thousand mid-size cars from Ghana's roads.

Enabling measures

These were mainly in the form of fiscal policy instruments. In 2007 the Government imported and distributed for free some six million CFLs to residential consumers in exchange for installed incandescent lamps, in its initial effort to encourage the use of CFLs. Additionally, in 2008 it removed duties and VAT on CFLs to make them affordable to households, and passed a legislative instrument (L.I. 1932.) to prohibit the manufacture, importation and sale of incandescent lamps.

Cross-cutting issues

Because it will help cut CO₂ emissions, the project is directly linked to climate change mitigation. As such, it offers the country opportunities to improve its capacity to adapt to climate change and mitigate existing and future emissions of CO₂. The main cross-cutting issues are the use of energy-efficient lightening, such as CFL, and the impacts of efficient lightening, which may benefit women and children more, compared to men. In a study by Lee et al (2013), women are more likely to engage in energy-saving practices and are more willing to pay a higher price for energy efficient light sources. In addition women were more likely to perceive lighting as an important factor in everyday lives than men.

Sustainability and replicability

There are opportunities for the expansion of the CFLs exchange programme to increase the peak electricity savings and other benefits, such as CO₂ savings and postponing investment in the expansion of electricity generation, which have so far been achieved. These benefits could encourage the replication of the project in other inefficient electric gadgets. A number of policy interventions were put in place to ensure the project's sustainability. In 2008 a facility for the manufacture of CFLs was established in Ghana and it turns out high-quality CFLs, certified by the Ghana Standards Board. Legislative instrument LI 1932, which prohibits, among other things, the importation or manufacture and sale of incandescent lamps in the country, and the removal of duties and VAT on CFLs were all intended to make CFLs available and affordable to all.

Lessons learned

The major lesson that can be learned from this project is the importance of making policy decisions that are supported by research, and effective stakeholder involvement. Supported by research, the project demonstrated that peak load could be reduced, making it easy to convince the Government to undertake the project. Additionally, before the project's implementation the Energy Commission consulted all stakeholders to ensure their buy-ins and the role they were to play

Case 7: Energy efficiency improvements through the installation of capacitor banks

In Ghana, public institutions have been identified as high energy consuming entities that incur very high electricity bills. Failure by the Government to pay the huge bills and in a timely manner has led to utility companies' high indebtedness. This poses operational challenges to the companies with dire consequences for their operational sustainability. The project is the outcome of energy audits that revealed that the power factor in government institutions was low, and that many public institutions had low power requirements that could be met efficiently through power factor corrections.

Design and implementation

To address the problem of low power factor in government institutions, the Ministry of Energy and the Energy Commission installed automatic capacitor banks to reduce electricity consumption, and ultimately, government expenditure on electricity in public institutions. In the absence of automatic capacitor banks, inefficient motors and other machines draw high electricity but use only a fraction for the actual task to be performed. An automatic capacitor bank is a device that ensures that only the required amount of electricity needed to run equipment and other high-energy consuming machinery is loaded.

The project involved the installation of automatic capacitor banks in six places: the Ministry of Defence, Korle-Bu Teaching Hospital, the Office of the President, the Food and Drugs Board and the Parliament House, out of the 24 public facilities and institutions whose electricity bills are paid by the Government. The capacitor banks were expected to improve the power factor, thereby reducing energy demand, power factor surcharges and consequently improve efficiency.

Figure 4 An automatic capacitor bank in a metal case



Source: Energy Foundation, Case study 006.

Expected/realized outcomes and impacts

Capacitor banks are installed to improve the quality of electrical supply and energy efficiency, especially in public institutions. While this comes with environmental and social benefits, the expected outcome and impact are mainly in economic terms (such as energy efficiency and increased savings in public utilities expenditure).

Economic impact

Available data suggest that the installation of automatic capacitor banks in six facilities reduced their maximum demand from 11,743 Kilo Volt Ampere (KVA) to 9,889 KVA, recording energy savings of 1,854 KVA. In monetary terms, this amounts to a saving, to the country, of GH¢ 39,145 a month and GH¢ 469,740 per annum. Discussions with the Energy Commission suggest that the project has been positive in ensuring efficiency in energy consumption and has positive returns and a shorter payback period.

Social impacts

The project's social implications are enormous. Reduction in public expenditure on electricity through heightened efficiency will expand the fiscal space and make more money available for other government social expenditure. The cut in expenditure has also reduced litigations between government institutions and utility companies. The Electricity Company of Ghana has occasionally threatened to cut power to health institutions because of indebtedness. Cuts in expenditure may also make it easier for the utility companies to meet their service delivery.

Environmental impacts

The environmental benefit of this project is quite revealing. Had the 1,854 KVA not been saved, it would evidently have been generated from crude oil, which would have increased CO₂ emissions considerably.

Cross-cutting issues

A notable observation of this project in terms of cross-cutting issues is the efficient use of technology. Automatic capacitor banks are very handy energy technologies that in use throughout the world.

Sustainability and replicability

Sustainability and replicability have remained a challenge in implementing the project. While 18 other government institutions were targeted for inclusion in the project, this has not happened, largely as a result of financial constraints. The huge cost of installing the devices relative to the energy savings and the increasing indebtedness of government institutions to the Electricity Company of Ghana has imposed financial constraints on it, stalling the replication across the nation. The Government has also indicated that the private sector should be encouraged to undertake similar energy-saving measures to ensure that the project is sustained and replicated.

Lessons learned

One lesson that can be drawn from the project is to ensure that policy is supported by evidence-based research. This always leads to the use of the best data that guarantee optimal benefits. In this project energy audit in government institutions established that electrical equipment being used in public institutions was old, inefficient and drew more energy than was required to power machines. The best policy response was the use of an automatic capacitor bank to correct the situation. Without the audit, other less efficient measures, such as changing the equipment, could easily have been used. In general, a proper needs assessment is crucial for any project.

4. Challenges to, and opportunities for the implementation of inclusive green growth

Following the case studies and lessons learned, this section of the report elaborates on the challenges and opportunities identified in the implementation of IGG in Ghana. In identifying the challenges the report placed particular emphasis on the core hurdles that must be scaled to ensure that Ghana replicates the good practices of existing IGG project activities in other sectors and across the country. As for opportunities, the report identifies enabling conditions (including natural resources, policies and legal frameworks) that can be harnessed to promote IGG projects and programmes in Ghana to advance GE in the long term.

4.1 Challenges

Ghana faces various challenges in its quest to promote IGG and to transition to GE. Those identified include: financing the high initial cost of investments; the ability to sustain and replicate projects; ensuring that IGG initiatives contribute to poverty reduction; effective commitment from the leadership; the problem of embedding IGG in long-term strategies; the role of the international community; better involvement of stakeholders; and the need for legal backing for GE activities in Ghana.

Financing of high initial cost of investments

The high initial investment cost of implementing IGG may be beyond Ghana's reach and could in some circumstances compete with the country's immediate development challenge—poverty reduction remains one of the biggest challenges. Many of the GE projects that have been implemented had some donor funding because the government budget is not big enough to accommodate such investments. The high donor component of GE has the tendency to define GE activities that may not be in the best interest of the country.

Sustainability and replicability of projects

Another major problem is the sustainability and replicability of projects, which is directly linked to the finance challenge. For example, the installation of capacitor banks to boost energy efficiency, and many other projects not mentioned here, are discontinued once they are weaned off donor funds. The major challenge is that sustainability is not incorporated into many project designs, and overlooked in the implementation phase. In many cases sustainability is an afterthought and inserted into projects without a clear definition of measures for its implementation.

In addition, the monitoring and evaluation of projects is considered as a requirement but not an effective tool for learning lessons to facilitate project replication. Many monitoring and evaluation activities focus on establishing whether project objectives are achieved, but fail to properly document challenges and failures from which lessons can be drawn. Projects are also mainly planned and implemented by the Government with no private sector participation. A joint public-private partnership may allow balanced development, where the Government may pursue the public interest while the private sector pursues the private interest. Such balance can ensure that the project is sustainable. The highly successful implementation of the outgrower scheme suggests that projects that give a sense of ownership to the beneficiaries elicit their commitment. This helps guarantee the success of the project since the beneficiaries' fortunes are tied to the project's outcome. Making beneficiaries contribute partially to the financing of the IGG project is a way of giving them a sense of ownership. The beneficiaries should be supported through loans to make financial contributions to the project.

Ensuring that IGG initiatives contribute to the goal of poverty reduction

One major goal of the IGG is to ensure inclusiveness and poverty reduction. As such, if policy on GE fails to adequately consider poverty, this may defeat the foundation of the paradigm. There is reason to suggest that present policy on GE meets external conditions sometimes to the detriment of the population. Many of the GE projects being implemented satisfy the general conditions for a GE but may neither be in the best interest of the country nor have the best impact on poverty. This means that poor people could end up making a lot of sacrifices if complementary policies do not go far enough to reduce poverty. For example the international community's focus on the mitigation of climate change at the expense of measures to adapt to it in several areas of GE may have adverse effects on poor people.

Effective commitment from leadership

The Government's commitment to the transition to a GE is a major force in the success of the IGG. Governments have short terms in office and, as such, are more interested in short-term social benefits that win them votes than on long-term ones. This being the case, Governments are more likely to accept GE projects if they demonstrate short-term benefits. Such benefits should be supported by research and provide qualitative and quantitative assessments of cost and benefits that appeal to finance ministries, which control the budget. It was very easy to implement the Replacement of Incandescent Bulbs with CFL, because research demonstrated that the replacement would immediately reduce the peak load, and at a time when the energy crisis was looming, the Government had no option than to implement the project.

The problem of embedding IGG in long term strategies

Inclusive green growth is a complete development paradigm shift that requires Ghana to tread with caution in its implementation. However, one major challenge that has confronted many developing countries in the implementation of the sustainable development agenda is the lack of long-term plans. In fact sustainable development policies in Ghana, as in many African countries, have been driven by medium-term strategies even though the agenda is intended to set the direction for decades, if not generations to come. Ghana could learn a lesson from this by: developing a long-term strategy in GE activities where all stakeholders stand to benefit; and incorporating all medium-term plans in the long-term plans, and the short-term plans in the medium-term plans.

The role of the international community

The international community plays a vital role in the transition to a GE. Currently, technologies for green activities reside in the west and are often very expensive. A shift from a system mainly motivated by profit to one where social considerations are factored into overall business goals will push the IGG agenda forward in many developing countries. Evidently, such a shift will make green technologies more affordable to the rural population. Additionally, the international community's failure to fulfill pledges owing to harmful conditionalities, and the country's inability to negotiate better deals pose a serious challenge in the implementation of GE projects.

Better involvement of stakeholders and provision of legal backing for GE activities

Better involvement of the relevant stakeholders, justification of the reasons for carrying out specific IGG activities, dialogue with all the individuals affected and backing the activities with laws makes it easier to conduct and enforce GE projects than merely allowing them to be implemented as a policy. Ghana today enjoys stable democratic governance, with its people better off resolving their problems through the law courts than by resorting to other means, and placing emphasis on their legal rights. Indeed many IGG activities in the energy sector have been carried out efficiently because of effective stakeholder involvement, dialogue with the people affected and the promulgation of laws and regulations on some policies to make their enforcement easy. The replacement of incandescent bulbs with CFL was made possible with the enactment of a regulation that cleared the way for enforcement.

4.2 Opportunities

The promotion of IGG projects and programmes presents many opportunities to achieve GE in the long term. Literature on the topic generally argues that while green development policies may have some negative impact on other policies and policy domains (such as those on poverty, growth, employment and trade) in the short term, the matter could be addressed in the long run with relevant complementary policies. For example, introducing emission charges on fuel to control air pollution may increase transport fares in the short run, which can affect all sectors of the economy since transport is an intermediary input to all production processes. Using revenue from emission charges to replace growth-inhibiting taxes on capital could address the impact of the emission charges. However, in Ghana, where market failure is common, caution is required because the complementary policies may not be implemented and, if they are, they may not achieve the desired results owing to these failures.

In terms of agriculture and land use management, Ghana is endowed with enormous natural resources that can be sustainably exploited to “green” national growth. The abundance of fresh water bodies provides major opportunities for green investments in intensive aqua farming. This will offer employment throughout the year to people engaged in farming activities, the majority of whom are underemployed when the farming season ends, as well as alternative employment to the large non-farming rural labour force.

The relative success and acceptance of GSLWM and RTIMP by communities and individuals is an opportunity to continue educating rural communities on the need to adopt sustainable agricultural methods, and to build their capacity in that regard. Documenting success stories under the RTIMP, for instance, makes it possible to disseminate the stories to other rural communities and farmers on the benefits of sustainable use and management of soils and water resources.

Ghana’s forestry sector offers opportunities for inclusive green growth investments. Green investments in agro-forestry, afforestation and woodlot plantations in areas threatened by desertification, especially in the Northern Savanna regions, will appeal to the Government and the communities alike because they have acknowledged that it leads to sustainability. Investment to promote the cultivation of economic tree, such as rubber and cocoa, to recover degraded forest areas and protect existing forest reserves would also appeal to many communities. The identification and marketing of all ecosystem services that have so far remained unmarketed in Ghana also provides opportunities for green investment. This includes the payment of incentives to communities and individual forest landowners to deliver ecosystem services, such as watershed protection, biodiversity, recreation, and carbon storage.

Not only is Ghana rich in non-renewable resources (such as minerals, oil, gas), and renewable resources (including forests) but also in natural fuels (such as wind, water and solar), which can be harnessed to generate cleaner energy for development. Several policies, laws and regulations have been put in place that have completely liberalized energy generation and are supporting renewable energy development. The considerable increase in per capita income compared to other countries in the sub-region is also making renewable energy affordable to many people. It has been noted that many high-income households are shifting to the use of solar systems to secure their household energy supplies.

The Renewable Energy Law and the feed-in tariff provide incentives for grid-connected wind-generated electricity. Meanwhile taxes on solar energy products have been waived to encourage usage. Information from the Environment Commission indicates that wind speed in Ghana is fairly strong and it is possible to install wind turbines to convert wind energy into electricity.

Regarding waste and its management, Ghana’s five largest cities (Accra, Kumasi, Sekondi-Takoradi, Tamale and Tema) account for about 19 per cent of the total population and their residents generate an estimated 3,200 tons of solid waste per day. There are around 105 other urban localities each with populations above 15,000 that generate in excess of 5,000 tons of waste each day (Environmental Sanitation Policy, 2010). The organic component of solid waste from various studies is known to be between 60-65 per cent.

Waste collection and disposal in the country, especially in the cities, is a major challenge. From the baseline environmental sanitation data gathered in 2007/8, close to 76 per cent of households still rely on improper waste disposal methods, with less than 5 per cent relying on house-to-house collection. The Multiple Cluster Survey (2006) indicated that 61 per cent of the population is using improved varieties of household latrines, ranging from flush toilets connected to sewer or septic tanks, VIP latrines and pit latrines with slabs. There are about 44 waste-treatment plants in Ghana, some of which are functioning and others not. Green projects that consider the waste as a resource to be recovered, reused and recycled through composting systems and other processes will make a significant contribution to the IGG agenda.

In addition to these specific opportunities, there are others, economic and political in nature, which make investing in green projects feasible in Ghana. They include: an enviable political track-record; a liberal investment environment; numerous investment incentives (such as customs import duty exemptions, tax holidays, free transfer of capital, dividends and net profits, generous capital allowance, locational incentives, quota-free access to the markets of the United States and the European Union, duty-free export trade zones) and; high safety standards and precautionary measures by the Ghana Standard Authority, EPA and other regulatory agencies and a six million-strong well qualified and educated labour force. In addition, there are institutions and structures to facilitate green investments. In terms of climate change, there are several international financing mechanisms that the private sector can access through the Government for green investments.

5. Conclusions and recommendations

5.1 Conclusions

Ghana's experience in implementing inclusive green growth dates back to 1996 when the Government re-oriented all development policies around the economic, social and environmental dimensions of sustainable development, specifically around sustained poverty reduction. The current medium-term development blueprint for Ghana—the Ghana Shared Growth and Development Agenda (GSGDA, 2010-2013) spells out strategies and dimensions of GE. Climate change and the environment in general were incorporated into the mainstream GSGDA, which has many policy measures/actions in key sectors. This could have a positive effect on the inclusive GE. From Ghana's perspective, transformation to a green economy means having a sustainable recourse for policy direction in pursuit of best IGG practices in specific sectors, such as energy, transport, agriculture, water, forestry, urban environmental management and infrastructure, among others.

Ghana's current engagements in inclusive green growth projects and its ultimate quest to achieve a green economy stems from the GE's role as the engine for sustainable development and employment creation that will speed up poverty reduction. In addition, the IGG projects can help attain desired economic and social growth in several areas by investing in cleaner production technologies and, thereby enhancing efficiency in resource use. The projects can also use cleaner energy technologies and improved access to energy services. They can use more sustainable agricultural methods to help increase food security, and gain access to emerging new markets for green goods and services.

An analysis of some case studies of IGG projects in Ghana clearly indicates that their activities supported the use and valorization of local resources or of technologies. In addition, the formulation and implementation of project activities were integrated in climate change adaptation and mitigation. This was part of the effort to boost Ghana's capacity to adapt to and mitigate existing and future GHG emissions. Some of the studies adequately addressed gender concerns by ensuring women's involvement in the project and even by directly targeting some interventions at women. As for sustainability and replication, most project activities under the various projects were expected to continue or have continued beyond the initial implementation phase. Often the projects' economic, social and environmental benefits were to continue to accrue over time. Ghana is facing challenges in its quest to promote IGG and transition to GE. Nevertheless, it is using the success it has achieved in IGG projects, the lessons learned and opportunities identified by case studies such as those showcased in the present report to replicate such projects in other sectors and across the country.

5.2 Recommendations

Based on the findings, the following recommendations are made to help improve the implementation of IGG projects and ultimately support the GE agenda

Financial challenge

It is evident that the private sector possesses a lot more financial resources and expertise than the public sector. As such, introducing public-private partnerships in the implementation of IGG projects could help address the financial challenge posed by the prohibitive initial cost of investment in GE. This is achievable, with very clear policies that establish clear roles and responsibilities and that benefit individuals, the Government and the private sector in all IGG sectors. If accompanied by attractive incentives, such policies will encourage the private sector to finance IGG activities. The liberalization of energy generation

and introduction of the feed-in tariff policy bears this out, with many private investors now appearing to register to invest in power generation in Ghana.

In addition, there are many IGG and GE related funds including those on climate change, which Ghana has never been able to take full advantage of. Since 2008, Ghana has been able to secure only about US\$ 21.3 million from four of the 25 or more international public-funded initiatives. This is partly attributed to problems of access inherent in the funding initiatives namely: complex disbursement procedures; the fact that the majority of funds are presented in pledges and the inability of recipient countries to meet complex eligibility criteria; the fragmented nature of funds, which hinders efforts to synergize projects and programmes and national developmental goals and objectives; and priorities of many funds that are at odds with national priorities. A possible solution is to encourage the international community to exercise flexibility in fund disbursement, and national implementation agencies to enhance their efficiency and effectiveness. Adopting a carefully planned quota system in the allocation of funds to countries, along with binding conditions, could also help improve the situation. Innovative financial mechanisms, such as the creation of foundations, fiscal instruments, venture capital and trust funds for GE activities, could strengthen local resource mobilization. This in turn would help address the financial constraints inherent in the implementation of IGG activities.

Ensuring sustainability and replicability of projects

Like sustainable development, the IGG strategy processes need to be recognized as learning processes, in which information on progress towards sustainability and replicability is used constructively to revise the mechanism. It should be noted that the participation of the private sector, coupled with high tangible and intangible benefits, safeguards sustainability. The Roots and Tubers Improvement Marketing Project is sustainable because of the huge benefits associated with the GPC. By the same token, IGG projects should be well thought-out to include all possible benefits in order to achieve sustainability.

To sustain and replicate projects, it is also important for project documents to contain well-articulated and accepted implementation measures. This may be achieved by developing long-term projects with medium-term role-over components that define clearly the implementation of each stage. To be accepted and funded, such projects should also be well thought-out and have multiple impacts on development.

Improving monitoring and evaluation

IGG is a new development paradigm and therefore related projects should be constantly monitored and evaluated at set intervals. It is imperative to improve mechanisms for monitoring, follow-up, evaluation, feedback and verification. This will require strengthening data collection, especially at the district level, and the development of comprehensive databases on monitoring indicators. There is a need to incorporate aspects of sustainability and replicability in monitoring and evaluation documents, focusing on lessons learned. This will create the link required to identify projects' failures and successes. If possible, independent bodies should carry out monitoring and evaluation at all levels, using clear quantitative indicators. Around 5-10 per cent of the project budget should be set aside for monitoring and evaluation. The Roots and Tubers Improvement Marketing Project is an acclaimed success partly because of the effective monitoring system incorporating many of these characteristics.

Embedding IGG in long-term plans

There is a need to develop and implement realistic long-term green growth development strategies to guide the country's development. Medium- and short-term plans and annual budgets should be tied to the long-term strategies to ensure effective implementation. It is vital to identify and focus on sectors with considerable costs and comparable advantages first and later focus on other key sectors. The transition to a green economy will also require the development of action plans to support implementation.

Ensuring coordination and synergies

It is necessary to enhance stakeholders' coordination mechanisms in a specific IGG sector to minimize the duplication of efforts and create beneficial links. This involves ensuring consistency in sectoral development policies and plans in all district and regional departments. Links and coordination could also be enhanced if investment plans that address resource constraints are developed. To guide the implementation of projects, there is a need to develop clear steps and guidelines on: stakeholders' involvement; justifications for specific IGG activities; dialogue with individuals concerned; and legislative instruments to support policy enforcement. Indeed, many successful Energy Commission projects, such as the ban on the trade in used fridges and air-conditioners and the switch from incandescent bulbs to CFLs were achieved with the coordination and involvement of the relevant stakeholders.

Capacity development and technology adoption

The design, development, implementation and evaluation of GE are considerably new to Ghana, which has technological and capacity constraints. For example, the Energy Commission introduced the feed-in-tariff but there is a lack of technology and human capacity to implement the policy. Furthermore, while Ghana is promoting the use of wind energy, there is not a single wind turbine in country. For years the Forestry Commission has advocated the market policy of allowing individuals to pay for environmental services, but has never been able to achieve that objective. Indeed the implementation of market-based environmental policies in many developing countries has failed because of capacity and technological constraints. Resolving these issues will require sustained and effective capacity development and the adoption of technology. It is best not to re-invent the wheel but rather focus on adopting already existing technologies. Other necessary technologies can be identified and produced by scientific institutions with the relevant capacity or be imported as they become necessary. Building and sustaining strong links between local institutions of technology production and users of technologies is very important. Such institutionalized links will ensure the vertical and horizontal integration of technology in IGG activities.

There is also a need to establish a special framework to address the key barrier to technological access— inadequate financial resources. Interestingly, for climate change there are windows of opportunities that can serve as schemes for financing technological transfer in climate change adaptation and mitigation. An example is the carbon trading mechanism operated under the Kyoto Protocol. Afforestation projects could be registered for carbon trading and the resources accruing over time could be used to finance specific technology-transfer projects for climate change adaptation in agriculture, which is considered green.

Implementation of market based policies

Implementing market-based policies has proved to be an important tool for environmental policy management and consequently for harnessing IGG, and Ghana cannot afford to overlook it. As such the country should consolidate the implementation of market-based policies, such as fiscal instruments: progressive taxes or tariffs on energy, water and other natural resources; and the introduction of other ecological taxes which can facilitate a gradual shift in taxes away from labour to the environmentally adverse practices and encourage the 'polluter-pay principle'. Removing environmentally harmful subsidies is also imperative. All this could be achieved through a legal framework that facilitates green economic activities and regulates harmful forms of production and consumption.

Ensuring IGG initiatives contribute to poverty reduction objectives

Addressing the failure of GE activities to meet the poverty reduction objective requires complementary policies that focus on meeting the needs of poor people through fiscal and other instruments. This could play a pivotal role in the success of IGG projects. For example the implementation of the refrigeration rebate scheme succeeded because households received incentives to purchase efficient refrigerators. Meanwhile the Government engaged people trading in old fridges in a sustained dialogue to persuade

them to adapt to the change. In terms of climate change this will mean focusing on mitigation as well as adaptation policies with short-term benefits for poor people. Taking on board climate-change adaptation measures that also mitigate climate change or vice versa would be optimal.

Involvement of private sector

The Government should redouble its efforts to involve the private sector, especially the private financial sector, in formulating and implementing IGG in order to gain their acceptance and to form partnerships with them. The reason is that while the private sector has the necessary human and financial resources to carry out government plans and policies, it needs to be convinced that the returns on its investments are optimal. Alienating the sector at the design stage of projects denies it the chance to voice its concerns and to buy into government plans and programmes. Involving the private sector at all stages, especially the design stage will enable the Government to properly design policies that will enable the sector to take a chance on GE activities.

Collaboration between universities and private sector

There is a need to encourage research in inclusive green economy because universities in Ghana have not adequately responded to the needs of the private sector. There is a gap between the green economy research and development by the universities on the one hand, and the private sector on the other. Universities should be encouraged to undertake research on green economy issues and to develop curricula in the related field so as to entrench IGG in long-term development planning. There is a clear need to strengthen collaboration between the university and the private sector on IGG projects. Best practices in green growth projects can be instrumental in bringing universities and private sector operators together to collaborate.

Integrating the implementation of donor-funded projects directly into government programmes

In many donor-funded agencies, the order has been to create a separate agency to directly implement programmes and projects on the assumption that the public sector lacks the capacity to implement them, and that civil servants are overburdened with their primary responsibilities. Many government institutions provide such agencies with limited support partly because of the belief that the agency employees are by far better remunerated than civil servants. Directly integrating such programmes into the overall government programmes and supporting government structure will serve the dual purpose of achieving programme objectives and helping government employees improve their capacity in project implementation. .

Improving the role of development partners

Development partners should ensure genuine commitment to making aid effective by respecting pledges made, ensuring cooperation, coordinating with all stakeholders as well as creating synergies that ensure technology transfer and deployment, capacity development and institutional strengthening.

Many IGG projects are social projects designed to satisfy social and environmental objectives and therefore may imply economic risks. There may be a need to establish financial mechanisms that ensure risk sharing by different agencies with different objectives, including the beneficiaries. While this is possible, it will require careful thinking. The Roots and Tubers Improvement Marketing Project is a good example. Agencies that had more social objectives, such as the International Fund for Agricultural Development, supported sectors like education and awareness creation and research, that had very little direct economic benefits. For their part, private financial banks financed the acquisition of modern equipment that was more efficient and could increase productivity, which would allow beneficiaries to pay back loans, and the beneficiaries were also required to make some in-kind contribution and commitment.

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Annex 1: Mainstreaming green economy in Ghana's next development plan

What	How	When	Who	Remarks
		Formulation	Stage	
Presentation on GE to NDPC leadership	-Personal calls to schedule meeting -invitation letter for official meeting	1-2 Weeks (11th -24th March)	MESTI/IEPA/NDPC	Submit Strategy Paper on GE to them later
Develop Strategy Paper on GE (Maximum 10 Pages) and an Executive Summary Maximum (2 pages)	-Form A 3-5 Man Group to provide a draft -Ask Experts To Revise The Draft -Circulate Draft widely for comments	Draft prepared By 1st March	MESTI/IEPA	Frank Pinto and Daniel Twerefou to provide Technical Assistance.
Meeting with MDAs (PPME Unit and others)	Obtain info on meeting schedule by NDPC for MDAs, participate in such meeting and make presentation on GE	Depends on meeting schedules of NDPC	MESTI/NDPC	-Winfred Nelson to obtain info and provide idea -Have a special orientation for MLGRD on GE
Ensure synergies between GE, CC and sustainable development	MEST to --organize an internal meeting to discuss how to synergize GE with other policies -look at tools and methodologies to be used for all programmes	ASAP	MESTI/IEPA	
Briefing Sessions for CSPG Consultants and Chair Persons	Discuss GE with CSPG to facilitate the formulation of GE policies		MESTI/NDPC	
ENRAC Meeting	Provide orientation for ENRAC on GE and give them copies of strategy paper	April/May	MESTI	Undertake this activity during one of the ENRAC quarterly meetings
		Planning	Stage	
Get GE questions into the Planning Guidelines	Provide broad questions on GE for NDPC check list	After preparation of the next Development Framework	MESTI/IEPA/NDPC/ Energy Commission, MoE/ MOFA/ FC	
Meeting With MDAs/MMDAs	-Provide orientation on planning guidelines for MDAs and MMDAs with focus on GE (get GE Experts on the NDPC orientation team)	After the preparation of the Framework (by May)	NDPC with support from MEST I	This Meeting should consider the meeting with MMDAs
		Budgeting		
Meeting with MoFEP (Budgeting-TPU, Budget Division, Real Sector)	organize a meeting with MoFEP aimed at convincing them to factor in GE activities in the budget guideline	May/June 2013	MESTI/EPA./ MoFEP	-Should start with the 2014 budget guidelines -Guidelines for 2014 will be out in June/ August 2013

		Cross Cutting		
Wide circulation of GE Strategy Paper	-Send Paper to all MDAs and MMDAs -Share with ENRAC -Put it on the websites of MEST,EPA,FC,EC,MC and other	ASAP after Preparation	MESTI/IEPA	Involve the private sector and CSO.
Dissemination-Mass Media MESTI/UNDP Press Corps	-Organize press events to disseminate info on GE -Identify 1 or 2 good environmental journalists to write feature articles on GE	ASAP after preparation of Strategy Paper	MESTI/IEPA/ NDPC	

Annex 2: Institutions involved in IGG and GE activities in Ghana

Name of Institution	Role in IGG in Ghana
National Development Planning Commission (NDPC)	Oversight responsibilities for the preparation, coordination, implementation and monitoring of the medium-term plans and strategic plans prepared by the MMDAs and the Ministries, Departments and Agencies.
Ministry of Environment, Science, Technology and Innovation (MESTI)	Responsible for policy issues and exercises supervisory authority over six (6) statutory bodies charged with the responsibility of implementing policies in the areas of the environment and science. It is the lead institution for IGG and GE in the country and hosts the National Committee for Sustainable Development (NCSD).
Ghana Environmental Conventions Coordinating Authority	Established by MESTI to improve the institutional framework and capacity for the implementation of the three Rio Conventions (Biodiversity, Climate Change and the Convention to Combat Desertification), which has key implications for IGG, Has a mandate to develop the institutional framework and capacity to coordinate at the national level, efforts being made by various stakeholders for concerted action(s) to address the environmental and developmental concerns confronting Ghana as well as the global community.
Environmental Protection Agency	It is the implementing agency supporting climate change and IGG implementation process in Ghana and has worked assiduously to ensure that policy direction developed by MESTI are carried out.
Ministry of Lands and Natural Resources	The lead national entity responsible for the overall oversight and direction on Reducing Emissions from Deforestation and Forest Degradation Plus (REDD+) activities in Ghana. This is done through the National REDD+ Steering Committee, established in 2009.
Ministry of Finance and Economic Planning,	Representation on the National Committee on Climate Change. An active participant in national processes to mainstream IGG into national development planning. Recently strengthened its Real Sector Division to include a Natural Resources and Environmental Governance Unit. In the last budget cycle, MOFEP took further steps to develop budget guidelines for climate change. This is a major attempt to ensure that sector budgeting becomes responsive to climate initiatives and is in discussions with MEST to include issues on IGG into the 2014 budget guidelines.
Ministry of Energy, Ministry of Food and Agriculture, Ministry of Local Government and Rural Development, Energy Commission, Forestry Commission, and Minerals Commission	These are the other main national institutions involved in development and the implementation of IGG policies and programmes.