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Skills for Green Jobs in Uganda

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Abbreviations and Acronyms

BRT	Bus Rapid Transit
BTVET	Business, Technical, Vocational Education and Training
CBO	Community Based Organizations
CFR	Collaborative Forest Management
CIN	Countryside Innovations Network
COFTU	Central Organisation of Free Trade Unions - Uganda
DIT	Directorate of Industrial Training
FRMCP	Forest Resources Management and Conservation Programme
FUE	Federation of Uganda Employers
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoU	Government of Uganda
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House gases
GWP	Government White Paper on Education 1992
HSBC	Hongkong & Shanghai Banking Corporation
IAP	Indoor Air Pollution
ICS	Improved Cookstoves
ILO	International Labour Organization
INC	Initial National Communication
IOE	International Employers Organization
ITUC	International Trade Union Confederation
KCCA	Kampala Capital City Authority
LDCs	Least Developed Countries
LSSP	Land Sector Strategic Plan
MAAIF	Ministry of Agriculture Animal Industry and Fisheries
MEMD	Ministry of Energy and Mineral Development
MGLSD	Ministry of Gender, Labour and Social Development
MoES	Ministry of Education and sports
NAADS	National Agriculture Advisory Services
NAPA	National Action Plan of Action
NAFORRI	National Forestry Resources Research Institute
NAFRI	National Fisheries Research Institute (NAFRI),
NARO	National Agricultural Research Organization
NBS TV	National Broadcasting Services Television
NDP I	National Development Plan I
NDP II	National Development Plan II

NEMA	National Environment Management Authority
NGO	Non-Governmental Organizations
NOGAMU	National Organic Agriculture Movement
NOTU	National Organization of Trade Unions
NRM	National Resistance Movement
NWSC	National Water and Sewerage Corporation
RETs	Renewable Energy Technologies
SGR	Standard Gauge Railway
SIF	Strategic Investment Framework
SLM	Sustainable Land Management
SMEs	Small-Medium Enterprises
PCY	Promotion of Children and Youth Programme
PPPs	Public Private Partnerships
TVET	Technical Vocational Education and Training
UBOS	Uganda Bureau of Statistics
UMA	Uganda Manufacturers Association
UNCST	Uganda National Council of Science and Technology
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention for Climate Change
UNFFE	Uganda National Farmers Federation
UNHS	United Nations Housing Survey
UNREA	Ugandan Renewable Energy Association
UPE	Universal Primary Education
USDP	Uganda Skills Development Project
USE	Universal Secondary Education
UWEP	Uganda Women Entrepreneurship Programme
VSO	Voluntary Services Overseas
YLP	Youth Livelihood Programme
YOP	Youth Opportunities Program

Abstract

Economic development cannot be sustainable without a sustainable environment. In Uganda, the main greening shifts in the economy and the labour market have taken place in energy and agriculture but these shifts remain weak, due primarily to lack of institutional support. Skills for green jobs are instrumental in bringing about the desired change. Uganda has put forth several strategies for greening the economy and these include a National Strategy to Strengthen Human Resources and Skills to Advance Green, Low Emission and Climate Resilient Development; the National Policy on Climate Change; the development of a skills development strategy for clean technologies; and a policy for integrating climate change learning into Technical Vocational Education and Training (TVET). Moreover, the Cabinet has approved the implementation of Green Jobs Programme under the Ministry of Gender, Labour and Social Development. For full greening of the economy, these policies and strategies should target the skills needs for green jobs in various sectors and be incorporated into the occupational profiles, curricula and education and training provision for greening existing occupations and for developing emerging and new green occupations. The existing Business, Technical, Vocational Education and Training (BTVET) system should be driven by needs that cater for all aspects of labour market changes that arise as the result of environmental degradation, climate change and related policies and strategies. There should be a more effective Public-Private Partnership in the formulation and implementation of the training programmes targeted on establishing and improving the skills base for green jobs. More research and regular data collection should be undertaken with a view to updating the knowledge and progress in greening the economy.

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1. Introduction (objectives and methods)

The previous 2010 *Skills for Green Jobs I* report showed that the concept and scope of green job skills training was generally not well understood or implemented in Uganda and that the Ministry of Labour, the lead agency on labour markets and planning, was scarcely aware of the existence of green job skills in the country. Quantitative data on green skills and jobs in the country were lacking in all the relevant sectors. The report also recommended that policies on the promotion of green skills in all sectors of the economy should be developed. The current report has examined developments in skills for green jobs since 2010.

The findings of this study are based on information derived from a combination of sources including specialist consultations, structured interviews, key informant interviews, unstructured interviews and workshops, among others. The study has identified a number of interventions which, if fully implemented, could boost economic activities considerably to the tune of around ten per cent of GDP; deliver employment of up to 4 million jobs; and reduce future greenhouse gas (GHG) emissions by 28 per cent by 2040 relative to a conventional growth pathway. These benefits, if accrued in the short term, could increase national income by an estimated US$ 3.4 billion.

2. Major changes in the economy and employment shifts in the green transition (since 2009/10)

2.1 Employment context

Over the past two decades Uganda's economic growth has created jobs, but mainly in low productivity areas. Uganda's *per capita* GDP grew by more than three per cent, despite an extremely high rate of population growth during the 1990s and the first decade of the 2000s. The proportion of the population living below the poverty line declined from 56 per cent in 1992 to 24 per cent in 2010. This was partly because this growth was able to generate employment opportunities. However, these opportunities occurred mostly in low-value-added sectors, generating few improvements in labour productivity and thus only limited increases in wages. Today Uganda's labour force totals approximately 15 million individuals. With the world's most youthful population - 48.3 per cent under 15 years in 2010 (UN 2011) - and with a welcome increase in female participation in employment, Uganda has had the world's fastest growing workforce. In contrast, the total number of off-farm jobs in businesses with a fixed location is just over 1 million (UBOS 2010), having grown fast over the past decade. This has left the bulk of the labour force in the agricultural sector and the informal non-agricultural sector.

At the same time the increasing difficulty faced by the approximately 300,000 individuals who graduate from universities and technical colleges every year in obtaining appropriate employment confirms that the rate of job creation is slower than the growth in demand for appropriate jobs, owing largely to the rapidly expanding labour force.

The major changes in the economy and employment shifts in the green transition of Uganda have taken place in renewable energy and agriculture. But these greening shifts remain weak primarily due to inadequate policy, institutional support and implementation. National concerns such as climate change and loss of biodiversity require concerted efforts among various stakeholders and institutions at local, national and international levels along with Multilateral Environmental Agreements. With the right policies, institutional framework, partners, and immediate reinvestment on board, it is possible for Uganda to bring about the change it needs for greening its economy.

The labour market in Uganda is characterized by a fast-growing working-age population. The Uganda National Population and Housing Census 2014 established that 78 per cent of the

Table 1. Key labour market indicators for working-age population (15+), 2012/13

LABOUR MARKET INDICATORS	MALE	FEMALE	TOTAL
Working population	6,980	7,108	13,998
Unemployed	103	179	282
Labour force	6,994	7,287	14,280
Total employment outside agriculture	2,271	1,618	3,889
Labour force participation force	88.8	82.8	85.6

Source: Estimates based on Uganda National Household Survey 2012/13.

working age population (14-64 years) was in work. According to the UNHS 2012/13 the labour force participation rate of persons aged 15+ years was 86 per cent. Men were more active than women, with the labour force participation rate at 89 per cent for men and 82 per cent for women.

The 2012/13 Uganda National Household Survey revealed that agriculture employs the highest percentage of the working population. The proportion was higher for females (77 per cent) than for males (66 per cent).

Human resource and skills development

As a result of Uganda's policies on education, especially Universal Primary Education (UPE) and Universal Secondary Education (USE), education and training at primary, secondary and tertiary levels has improved tremendously and represent a big stride towards sustainable development. Over 80 per cent of children from poor households are now able to attend school compared to just 51 per cent before UPE was introduced in 1996. The introduction of USE has also improved school enrolment at secondary level, increasing it drastically, with girls accounting for 45.6 per cent of total enrolment. At present the BTVET system still does not produce the appropriately skilled workforce that Uganda needs to increase incomes and employment, and to compete in the East African and wider international markets. Fewer than 40 per cent of large and medium firms regard courses offered by BTVET institutions as relevant. Enrolment in public and private agriculture BTVET at all levels is low, accommodating only around 4,600 new trainees each year. Training offers are insufficiently diversified in terms of specializations, are unevenly distributed throughout the country and are not specific to the needs of different target groups. Programmes are generally of low quality due to inadequate resources.

Uganda has strengthened its research and training institutions to generate technologies and approaches in support of sustainable development. These include the Uganda National Council for Science and Technology (UNCST), the National Agriculture Research Organization (NARO), National Forestry Research Institute (NAFORI), National Fisheries Research Institute (NAFRI), and Makerere University,

Table 2. Employed population (15+) by main branches of economic activity and sex, 2012/13 (%)

ECONOMIC SECTOR/OCCUPATION	MALE	FEMALE	TOTAL
Agriculture, forestry and fishing	66.2	76.5	71.4
Trade	9.0	10.1	9.6
Manufacturing	5.6	3.5	4.5
Education	2.9	2.3	2.6
Transport and storage	4.3	0.2	2.2
Construction	4.2	0.1	2,1
Other service activities	2.4	1.7	2.0
Accommodation and food	0.6	2.4	1.5
others	4.7	3.1	3.9
Total	100	100	100
Number (Persons '000)	6,890	7,108	13,999

Source: Estimates based on Uganda National household Survey 2012/13.

among others. NARO has since 2003 developed up to 218 improved varieties, breeds and prototypes providing increased yields, food security and incomes. In addition, a number of studies have been conducted to establish the economic value of Uganda's natural resources.

Measures to improve conditions at workplaces, as well as to enhance gender and age-based equity in access to employment, have been initiated. Labour organizations have also been strengthened, with the National Organization of Trade Unions (NOTU) registering 20 trade unions in various sectors. Furthermore, workers are represented in several policy-level institutions such as Parliament, the National Social Security Fund Board and Immigration Board. Uganda is also promoting the externalization of labour and, to date, over 11,000 Ugandans have been placed in jobs abroad.

Skills for productivity in the informal sector

The informal sector in Uganda has not grown during recent years. It is operating at low productivity levels, and informal sector employment has declined. Yet the informal sector remains a stronghold of employment, accounting for 58 per cent of non-agricultural employment in Uganda. It needs interventions to increase productivity. Improved skills are not the only means but are an important factor in the strategy to develop SMEs and the informal sector as outlined in the NDP.

However, to date the BTVET system has largely neglected the specific training needs for informal sector employment. Pre-employment BTVET for school-age youth is inadequate to prepare graduates for self-employment. There is no systematic approach to skills development for people already in or seeking to enter the informal sector. Many of the training offers are supply-driven, are not based on market assessments, and only duplicate formal sector training at very low levels. Some very effective programmes cannot be replicated owing to lack of information exchange and resources. Training for the informal sector is largely donor-financed and therefore not sustainable.

2.2. Specific sectors of economic activity

Agriculture

Agriculture accounts for 22.8 per cent of GDP and employs 70 per cent of the population (UBOS, 2014). With a high population growth rate and the need to ensure food security, land-use change associated with promotion of agricultural activities in Uganda is high. This is especially so as regards land-use change in forests and wetland areas. To transform to a green economy, there is need to promote the adoption of sustainable technologies through market incentives that increase investment in sustainable land management practices, efficient irrigation and mechanization.

Civil society organizations supporting rural development in the agricultural sector include the Uganda National Farmers Federation (UNFFE) and National Organic Agriculture Movement (NOGAMU). The NAADS programme since 2002 continued to create substantial positive impacts on the availability and quality of advisory services provided to farmers, promoting the adoption of new crop and livestock enterprises, and encouraging the adoption of modern agricultural production technologies and practices. Furthermore, NAADS has also promoted greater use of post-harvest technologies and commercial marketing of commodities. The NAADS programme is providing 650,000 farmers country-wide with food-security-related technologies for proliferation as well as for ensuring household food security, and is planning to increase it 10fold (MAAIF, 2010).

Agricultural production in Uganda is largely uncompetitive. Unacceptably high post-harvest losses occur, and the level of farm mechanization is low. Farmers lack modern production skills. Jobs in modern agribusinesses are often held by foreigners. For export promotion and import substitution farmers need to diversify into new products and enterprises which require skills that are currently not available.

Renewable energy

Over 90 per cent of national energy demand in Uganda is met from wood fuel resources which are becoming alarmingly scarce. This prompted the development of a National Biomass Energy Demand Strategy (2001-2010) to ensure a steady supply and efficient use of biomass energy. Access to affordable, reliable electricity is a major constraint on new business formation, investment and growth in Uganda which is impacting on job creation, poverty reduction, education and the quality of life.

Despite the availability of many alternative energy resources in Uganda, for example biogas, solar and micro-hydro power, there is a heavy dependence on biomass energy, especially for cooking, due to its accessibility and affordability. This dependence on biomass contributes to increasing forest degradation, leading to fuel scarcity and rising fuel prices. The theoretical potential production of agriculture residues lies between 1.186 million and 1.203 million tonnes annually. So far, the only sub-sector that utilizes biomass residues for electricity production is the sugar industry. Small amounts of coffee and rice husks are also utilized for heat production in cement and tile manufacturing and in production of briquettes.

Uganda's fast-growing economy calls for a responsive energy sector to meet the demand for economic growth. Increasing rural coverage of grid electricity has the potential to proliferate agro-based and cottage industries and enhance green employment opportunities, thereby contributing to poverty reduction and alternative livelihood systems among the rural populations. To achieve the envisaged targets Uganda needs to develop 41,758 Megawatts by 2040, thus increasing electricity consumption *per capita* to 3,668 Kwh per annum. Uganda will significantly exploit her hydropower potential by developing large and small hydro-power plants. The major plants are Ayago North, Ayago South, Karuma, Isimba and Murchison Bay. Other renewable energy sources such as solar, wind, biogas and geothermal will also be developed. Development of nuclear energy from uranium deposits will also be considered. Development of renewable energy sources presents a big opportunity for Uganda's drive to a green economy. There is a high potential for international cooperation, especially through bilateral, multilateral and private sector support to address the investment gaps.

Solar: Uganda is endowed with favourable solar irradiation of 1,825 kWh/m^2 to 2,500 kWh/m^2 per year. Small solar applications are often used in rural electrification projects such as Solar Home Systems or solar water heating. Over 30,000 solar PV systems have already been installed in rural areas. Currently two larger PV plants are at the planning stage. The Ugandan government plans to build a 500 MW utility-scale solar plant and has awarded the contract to Ergon Solair, a Taiwanese-US partnership. Construction of the first plant was completed in October 2016. Additionally, a 10 MW PV plant is being constructed by Dubai's Access Power Middle East and Africa, the first PV project to benefit from the Get FIT scheme.

Waste management

Management and safe disposal of waste, including solid waste and sewage, hazardous and radioactive waste and toxic chemicals are key measures in greening the economy. Uganda's efforts to this end includes development of policies, legislation and strategies put in place since 1992 to manage waste; and the polluter-pays principle is used to discourage release of hazardous waste into the environment. Using this principle, the National Water and Sewage Corporation (NWSC) has put in place disincentives (fines) against industries that fail to comply. Strategies for sound management of chemicals have been integrated into the NDP and regulations on the management of hazardous chemicals are enforced by each sector to guide re-use and recycling of waste products. Government also announced a total ban of plastics of 100 microns and below in June 2009, although enforcement has not been effective. Measures for recycling of solid waste include improvement in the collection, transportation and disposal of solid waste and sensitization of urban communities to solid waste management in 18 Municipal Councils through a Solid Waste Compost production project implemented in partnership with NEMA.

Industry: Traditional routes to industrialisation have involved a trade-off between fossil fuel use and "going green". It is likely that industrial

development in Uganda will also involve an increase in emissions. However, there is an opportunity for Uganda to focus on how to deliver industrial growth while minimising damage to its natural resources base by using resource-efficient technologies and practices. This ambition should be reviewed over time as experience is gained and technologies evolve to minimise environmental damage still further. There is a clear opportunity to opt for "green" processes, but also to exploit manufacturing opportunities in green markets globally.

Urbanization

A package of eight interventions is expected to contribute US$ 4.3 billion to GDP in 2040. Many sustainable transport-related investments within cities (such as bus rapid transit and light rail systems) have high upfront capital costs but can deliver long-term, positive economic, social and environmental impacts such as better air quality. Specific green growth considerations for prioritising projects within Uganda's urban context include:

- The Standard Gauge Railway (SGR), which will link Uganda to other East African countries. This will enhance growth of exports and imports and regional trade competitiveness, while boosting jobs and reducing GHG emissions by displacing freight cargo from roads. Our analysis reveals a US$ 1.6 billion GDP impact by 2040 from an annual capital investment of around US$ 290 million;
- Improved bus systems in Kampala and other growing cities, which alongside improved traffic management can meet the mobility needs of rapidly-growing urban areas, reduce pollution and energy demand, and improve both safety and speed of transport. Implementing a bus system across major cities in Uganda, starting immediately in Kampala, could generate a US$ 1.6 billion GDP impact by 2040. Bus Rapid Transit (BRT) systems are a critical component and are aligned with the NDPII;
- Other urban interventions, including a Light Rail Mass Transit system in Kampala; enhanced national vehicle emissions standards; strategic land-use planning and proper zoning to reduce sprawl; development of urban waste management facilities in larger cities; capping of landfills and capturing of methane to produce bio-methane fuel; and effective flood risk management that incorporates future climate risk considerations.

Picture 1. Some of the solar PV trainees after a training session

3. Key policies and regulations

(green, climate change, and related employment / green jobs / skills, policy coherence and coordination, role of social dialogue)

Climate change

The government of Uganda, through its Ministry of Water and Environment, has been a keen and active participant in the global and regional processes which have shaped the discourse on climate change. In 2015 the government of Uganda pledged ambitious commitments at the 21st conference of parties in Paris.

Uganda has taken the initiative, as provided for by the National Constitution, to develop a long-term national development framework: Vision 2040. This vision outlines the medium and long-term strategies through which the country will adopt a development pathway that will lead to achievement of a green economy in the context of sustainable development and poverty eradication. The government of Uganda in its "Vision 2040" proposes to "review the entire education curriculum to align it with the global and national socio-economic needs" as a means, at foundation level, of addressing the human resources and technical capacity gap. Uganda is highly vulnerable to climate change and variability as its economy and the well-being of its people are tightly bound to climate. In order to strengthen individual skills and institutional capacities to foster green, low-emission and climate-resilient development, the country implemented a national UN CC: Learn Pilot Project (2011-2013). This project was initiated at the beginning of 2012 and was implemented over a period of 23 months. The Project aimed to foster a systematic and country-driven process to strengthen human resources and skills to advance green, low-emission and climate-resilient development. It was implemented under the leadership of the Ministry of Water and Environment. A national strategy to strengthen human resources and skills to advance green, low-emission and climate-resilient development was developed.

The development of a skills development strategy for clean technologies includes a policy of integrating climate change learning into TVET; scaling-up current efforts to integrate climate change in primary and secondary education; training artisans in producing energy-efficient stoves; and launching a climate-change awareness-raising campaign using mobile phones.

The national strategy and action plan to strengthen human resources and skills to advance green, low emission and climate resilient development in Uganda (2013-2022). The strategy proposes that investment in strengthening of human capacities to integrate climate change in primary and secondary education is critical. On 7 December 2016 Cabinet approved the implementation of **Green Jobs Programme** and further directed that the Songhai Model be piloted on government land. The programme is aimed at creation of green and decent employment, enhancement of labour productivity, and reduction of poverty. The programme targets both skilled and low-skilled, women and youth. Overall, the programme will contribute to reduction of the high levels of unemployment among educated and uneducated through:

i) promotion of workplace re-skilling and skilling for both skilled and low-skilled labour;

ii) promotion of resource efficiency and social safeguards at workplaces;

iii) enhancement of the productivity of workers and enterprises.

The national policy on climate change. the policy is designed to enable Uganda to pursue a climate-resilient, low-carbon and sustainable development path through an overarching policy framework for coordinated action by the different stakeholders. The draft national policy on climate change is multi-sectoral in nature and has been designed to guide a series of measures which address long-term challenges to Uganda's national development as a result of climate change over a period of 5–15 years.

Green growth strategy in Uganda

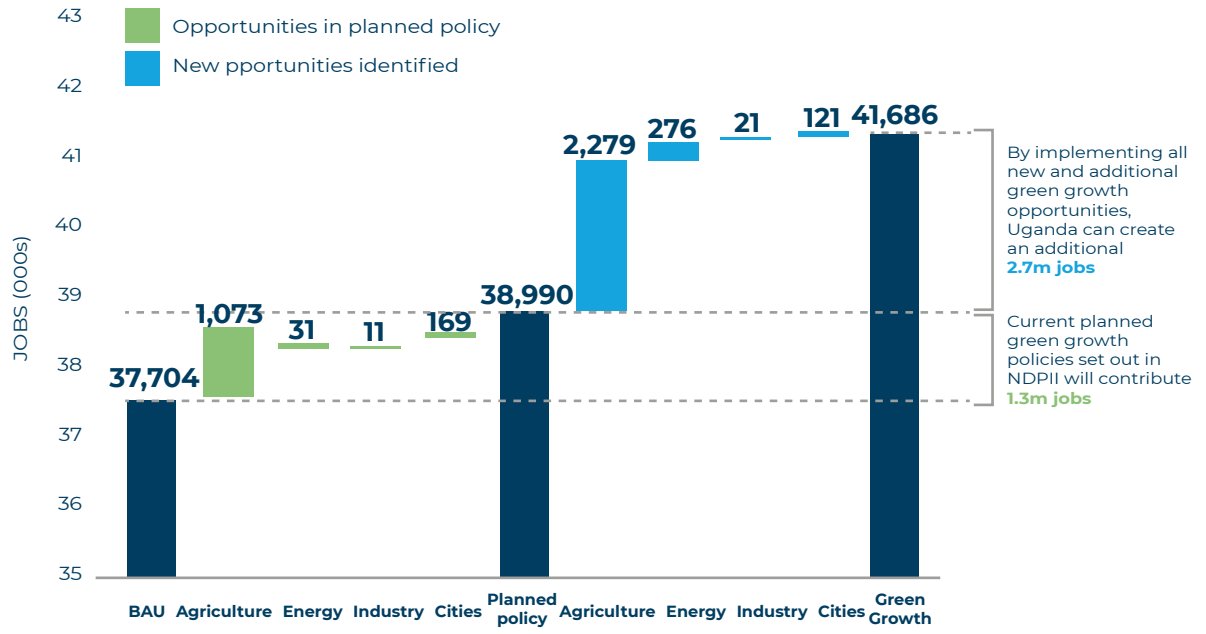
According to the forthcoming green growth strategy, there are a number of green growth options in Uganda; 23 priority green growth interventions were identified, filtered, and then quantified across the four prioritized sectors, namely agriculture, industry, energy and cities. Some of these interventions include integrated urban planning, improved cooking stoves, solar irrigation, off-grid renewables, and industrial energy efficiency (GOU; 2016). According to the proposed green growth strategy, one of the key findings of the analysis is that green growth could generate 1.3 million jobs by 2020, rising to around 4 million in 2040. Most of the jobs would be generated through higher-productivity agriculture. Of the jobs created, the analysis estimates that 45 per cent are likely to be "youth jobs" and that 51 per cent will be "more accessible" to women. But to estimate the aggregate net job creation potential associated with the investment programme in Vision 2040 would require a fuller understanding of factors not fully modelled in Figure 1.

Policy coherence and coordination

In an effort to strengthen sustainable land use and management, Uganda has developed sector-wide guiding frameworks, namely the Land Sector Strategic Plan (LSSP) and the Strategic Investment Framework (SIF) for sustainable land management (SLM). These frameworks aim at increasing investment in the sustainable management of land under forests, agriculture and conservation, while ensuring sustainable growth, productivity and economic development in the natural resources sectors.

Some of the projects being implemented in this context include the Agricultural Technologies and Advisory Services project; Sustainable Land Management (SLM) in the "cattle corridor"; the **COMESA**-funded National Climate Resilient Conservation Agriculture Programme; Stimulating Community Initiatives in SLM; the National Livestock Productivity Improvement Project; and the Farm Income Enhancement and Forest Conservation Project, to mention but a few. Furthermore, institutions that handle land and natural resources have integrated environment and natural resource management issues into their planning processes. Guidelines for mainstreaming environment issues have also been integrated into the performance monitoring schemes and planning cycles of district local governments (Government of Uganda 2012).

Figure 1. Green growth scenario versus BAU planned policy scenario: contribution to employment in 2040



Source: NCE modelling.

4. Skills development measures for the green economy

4.1 Skills needs identification / anticipation

In Uganda, there is no system in place or institutional responsibility for identification of current and future skills needs for any kind of job – non-green or green – in the labour market. Conventionally, companies identify their own skill requirements on their own and provide on-the-job training for the blue-collar jobs, while they recruit trained people from the open market for white-collar jobs. In the present exercise, however, the assessment of skills needs was made in consultation with the existing players (especially the companies involved) in greening the economy. Developing a skills base to overcome the employment challenges in Uganda is urgently required. This includes creating underlying skills and institutional capacity across government to implement effective public policy, as well as those skills required by the workforce for productive employment. Uganda has recently reformed its skills delivery system under the new Skilling Uganda Task Force. This has set up a number of Sector Skills Councils to enable government and the private sector to work together in identifying training needs and reforming training curricula. This is an ideal opportunity for integrating consideration of relevant green growth initiatives into the vocational and technical training system, and for undertaking a skills gap assessment for green jobs in Uganda.

Which skills are needed and how they are identified (Which technical skills? Which core (generic) skills? Is it a systematic process or not, are there data issues, who are the main partners?)

Sustainable agriculture: organic agriculture

Sustainability skills in agriculture and forestry include the following: retraining in new farming practices; crop diversification and organic farming; entrepreneurial skills for farmers; retraining in biofuel production; retraining in new technologies; retraining in eco-/rural/forest tourism; complex use of timber and new technologies in wood processing and eco-counselling.

In Uganda 200,000 farmers are currently practising organic farming. NOGAMU identified skills needs for building capacity in production and processing of organic products, and training needs for farmers and individuals interested in organic farming in such areas as management of pests and diseases in organic production, soil fertility management in organic systems, postharvest handling, weed management in organic farming, and processing and marketing of organic products. NOGAMU offers a range of services in the areas of training research and extension. In 2011 the College of Veterinary Medicine, Makerere University also introduced a course on organic farming in the Bachelor of Animal Production Technology and Management. Uganda Martyrs University targets individuals who have had basic training in agriculture in the organic farming degree programme since 2005 (MAAIF 2011).

To aid transformation to a green economy there is need to promote the adoption of sustainable technologies through market incentives that increase investment in sustainable land management practices, efficient irrigation and mechanization. These measures should be re-enforced to increase access to markets and address unfair trading policies and practices, including tariff and non-tariff barriers and protectionist policies usually imposed by developed countries. Agricultural systems should be made more efficient, productive and profitable especially to enable the resource-poor to secure their livelihoods and ensure food security as a strategy for adapting to climate change. Resilience of agricultural systems can be

re-enforced through measures that enhance soil carbon in addition to the benefits of adaptation to climate change, particularly conservation-oriented agricultural practices (GOU; 2012).

There should be capacity-building for improving performance in the field (for household food security) and improved competitiveness in markets (for income generation) through:

i) focusing on improving the use/knowledge of natural processes for food crops production;

ii) organic soil fertility management;

iii) organic pastures and livestock management;

iv) selection and improvement of traditional seeds and breeds;

v) value-addition through processing and labelling;

vi) internal control systems and organic certification;

vii) market intelligence and trade partnerships.

Green growth interventions that raise agricultural productivity, increase farm incomes and improve climate resilience have the potential to significantly improve growth and reduce poverty. Potential economic gains from investing in green growth interventions in agriculture are high, contributing US$ 2.8 billion to GDP in 2040 under the green growth pathway, the majority of these gains being attributed to increases in yields. With such a large proportion of the labour force engaged in agriculture, investments in productivity and facilitation of trade will have far-reaching benefits. The reform of the agriculture sector is a precondition for Uganda's structural transformation. It will also provide jobs for those currently leaving rural areas for cities and thereby putting public services under strain. The major occupations involved in this activity include agricultural workers, agricultural advisors, chemists, traders and farmers. This sector has much scope for creating new "green-collar" jobs through retraining.

Renewable energy: wind, solar, hydropower, bioenergy and geothermal

Skills to be developed for the renewable energy sector have to cover a wide range of different aspects of the value chain of renewable energy projects, depending on the choice of technology for a particular project. For solar photovoltaic systems, for example, engineers as well as technicians will be required to cover the whole value chain from assembly of solar PV modules to project development skills for PV system design, resource assessments, business plans, and so forth. Project planning skills are central, while specific technical and electrical skills will be needed to construct and assemble solar PV plants. Similarly, wind, hydropower, bioenergy or geothermal power plants need specific sets of skills to facilitate development and operation of projects. According to the estimates of the experts, currently around 15,000 solar engineers and technicians and 100 green entrepreneurs are involved in this sector. According to the existing literature and interviews with the experts, major occupations in this sector include solar engineers, bioenergy technicians, energy assessors, masons, sales persons, marketing, maintenance and repair personnel and so forth. This sector is totally green and has ample scope for creating new green-collar jobs.

Greening buildings

Green building is a new concept in the world, particularly in Uganda which might be a promising location with its high urbanization. The construction sector is growing rapidly in the country, generating considerable employment for the poor. Available evidence shows that buildings consume or are responsible for 40 per cent of the world's total energy use and 35 per cent of the world's CO_2 emissions. The main occupations in building construction include architects, engineers, masons, and site managers. New skills needed, therefore, include green architects, green town planners, green civil engineers, green supervisors and green masons, alongside architecture technicians, boilermakers, carpenters and their assistants, cement masons, construction equipment operators, insulation installers and assistants, iron and steel workers,

metal fabricators and fitters, welders, cutters, solderers and brazers. Among new and emerging occupations are building inspectors, commercial green building and retrofit architects, cool-roofing installers, energy-efficient site foremen, environmental construction engineers, environmental maintenance workers, green-building architects, green-building designers and specialists (commercial and residential), green plumbers and pipe fitters, retrofit designers, solar commercial installers, electrical foremen, and solar installation managers and project foremen.

Sustainable forestry and tourism: certified hotels, ecotourism and adventure tourism

Ecotourism and crafts in Mpanga collaborative forest management (CFR) in Mpigi is a living example of how ecotourism, crafts and environmental education can enhance conservation and protection. An ecotourism site at Mpanga, under the management of the Forest Sector Support Department, has played a key role in employment and revenue generation, some of which was ploughed back into the local community. Villagers have also benefitted by providing catering facilities to visitors, while nearby traditional shrine owners earn direct income from visits by tourists. To help people understand why the programme was concerned about the Mpanga forest, an environmental education programme was initiated for schools and the community. The programme harnessed women's power in the home as major consumers of forest products. Women, through the sustainable crafts programme, have contributed to conservation of Mpanga CFR. The project, funded by VSO Uganda and the European-Union-funded Forest Resources Management and Conservation Programme (FRMCP), trained 200 women in the making of export-quality crafts using local materials in a sustainable manner. These crafts are exported to Europe or sold in the local tourist destinations at fairer prices than they would command if sold locally. Thirty trainers were also trained. About 190 families have direct income from sale of crafts, and beneficiaries now view forests with more interest: they look not only at what they can directly use, but also at how they can use them to raise income while keeping them intact. Through the craft project many families have been able to plant trees, such as Moringa and Neem, which are also a source of food and have medicinal qualities. The craft project alone has distributed 200 trees to women participants (source: Friends of Mpigi Forests Conservation and Development Organisation). Women benefit more from firewood-cutting, medicinal herbs and crafts. This is because women harvest firewood and herbs for subsistence use as part of fulfilling their gender roles and responsibilities for caring for the family. They use the crafts for both subsistence and income generation.

Recycling

There is a need to create or support systems or technologies that advance from simple recycling to reducing and reusing waste, whilst ensuring that workers are safe from exposure to harmful working conditions. New skills for waste collectors include separating organic waste so that it can be used for composting, among other things. Other innovative uses of organic waste also require new skills such as the manufacture of charcoal briquettes from the residues of carbonized stalks of cotton, millet, maize and tiph (a wild herb). Training needs include retraining in waste collection through to recycling, along with skills in methane and energy recovery. Management and safe disposal of waste, including solid waste, sewage, hazardous and radioactive waste, and toxic chemicals are key measures in greening the economy. Measures for recycling of solid waste include improvement in the collection, transportation and disposal of the waste and sensitization of urban communities to solid waste management in 18 Municipal Councils through a Solid Waste Compost production project implemented in partnership with NEMA. However, the development of cottage industries for utilizing solid waste including the recycling and reuse of non-biodegradable products, for example plastics and polythene materials, is still relatively limited, mainly to the production of mats, ropes and beads for sale locally (Government of Uganda, 2012).

Sustainable transport

An efficient transport system is essential for socio–economic transformation and a prerequisite for a green economy. Over-reliance on road transport, as in Uganda, is not a viable choice from a green economy perspective, taking account of the high cost of road construction and maintenance, the high consumption and low efficiency in the use of petroleum, traffic jams and associated high carbon emissions. Uganda is planning and developing a standard-gauge railway system with high-speed trains for both passenger and cargo freight to link Uganda with neighbouring countries to facilitate regional and international trade. Uganda is also improving its road infrastructure by enlarging roads, creating flyovers and putting in place traffic lights to minimize traffic congestion. Mass transport systems should be developed, especially in urban centres.

Sustainable urbanisation

Urbanization in Uganda is characterized by unplanned construction leading to sprouting of unplanned towns and slums. Development has also been concentrated in Kampala, putting enormous pressure on the city's limited resources. By 2040 five regional cities are planned, including Gulu, Mbale, Mbarara and Arua. This will be guided by urban planning legislation, integrated physical planning and strict development control. During the Vision period, Government will develop physical area master plans to guide the development of the "Greater Kampala" and other regional cities and towns. Environment and waste management, including pollution control, wetland management and conservation of green areas will also be key ingredients of this urbanization.

Promoting Alternative Energy Sources and Sustainable Use of Energy in Schools: the case of the Environmental Education Foundation

In an effort to counteract wood fuel use, Uganda Environmental Education Foundation (UEEF), a local non-government organization (NGO), implemented a pilot project titled "Promoting Alternative Energy Sources and Sustainable Use of Energy in Schools". The project was implemented in five schools with the objectives of increasing knowledge, awareness and capacity to use and manage alternative energy sources in Mukono District, increasing the use of solar energy systems and improved stove technologies, and exploiting their commercial and economic potential. The interventions in each school included:

i) establishing a school woodlot;

ii) construction of a demonstration improved institutional energy-saving stove; and

iii) installation of a solar energy system.

Through these interventions significant savings were made by the schools in terms of expenditure on purchase of firewood. For example, during the second term Kojja Secondary School, with a total of 654 pupils, used four tonnes of firewood costing Ushs. 240,000 while using the improved stove. This was down from the 12 tonnes used during the first term using the ordinary stove which cost the school Ushs. 720,000 in firewood purchase. This resulted into savings of Ushs. 480,000. Other impacts included reduced degradation of natural forests in the neighbourhood as less firewood was required by the schools; improved school performance since students were able to do their night preparation work using solar lighting; improved kitchen hygiene and health of cooks since the improved stoves do not emit smoke; reduced theft of school property as the solar lighting improved security around the school; and schools' acquisition of their own firewood sources from the planted woodlots. A study tour organised for 30 schools from within Mukono district led to replication of the stoves in 12 other schools. Therefore, the project was on target for saving forests and enhancing national efforts towards achievement of a green economy in the context of sustainable development and poverty eradication.

Green industrialization

Uganda aims to transform itself into a modern prosperous economy within a generation and industrialization is core to this process (NDP). Green industrialization means employing technology in the production of goods and

services with low carbon emissions, efficient resource use and decent job creation. To realize a green industrial sector Uganda should put in place appropriate policies and legal frameworks to promote low-carbon and efficient technologies; help industrial support institutions develop and sustain a competitive industrial sector; enhance low-carbon technology transfer, adoption and adaptation; increase and broaden the pool of skilled industrial human resources (engineers, technologists, technicians); increase and improve the physical infrastructure of industrial support; provide cost-efficient and reliable energy for industries; provide industrial finance and access to credit; broaden the scope for forward and backward integration of industries and agro-industry linkages; support the young and weak domestic private sector; increase investment in research and development, innovation and entrepreneurship; and increase foreign direct investment in the industrial sector. Major occupations in this sector include garbage cleaners, garbage collectors, supervisors, machine operators, truck drivers and so forth. This sector has much potential for greening the environment and creating new green-collar jobs.

Picture 2. Wood cooking stoves

What is the role of social dialogue and institutional set-up?

At the moment there is no recognized or documented social dialogue as regards green jobs in Uganda. However, there is interaction with all the key stakeholders.

4.2 TVET provision for new green occupation and for greening established jobs/ occupations

How massive is the need to upgrade current competency standards (curricula, training programmes etc.) for well-established occupations? How systematic are the revisions and what are the underlying mechanisms?

The provision in BTVET to meet the challenge of green economic restructuring remains limited. There is no active labour market policy or planning of initial and continuing training. The content of TVET programmes is largely defined by the curricula for particular courses and job profiles. The focus of training within the TVET systems is mostly on practical (technical) skills and competencies. Training in entrepreneurial skills, including economic or management skills, is less common. However, in many cases the lack of proper teaching equipment impacts substantially on the quality of technical skills acquisition of students. In Uganda there are no criteria for designing a new green competency standard. There is a need for complete upgrade of the current competencies as green job competency is not so visible.

How important are new green occupations and the design of related competency standards, curricula and training? What are the criteria for designing new competency "green" standards?

The new green occupations are important in that they provide quality manpower skills and decent jobs and mitigate the negative impacts of climate change. The process of *design of related competency standards* should help provide

Picture 3. Growing tomatoes as a green enterprise

skills for the needs of the enterprise, provide for workplace training and lifelong learning, and be able to build competencies for the future.

In Uganda there are no criteria for designing a new green competency standard but there are some competencies which can be acquired from indigenous technical knowledge and improved, such as use of farm-made pesticides from ash and production of briquettes from farm wastes.

What is the role of the private sector and social dialogue, delivery channels, special government support programmes?

The private sector is involved in all aspects of skills for green jobs in Uganda; it is mainly involved in training, designing of curricula, employment of trained personnel, and sponsoring of trainees. There is interaction of the private sector with the training institutions, with the employers and with the students being trained, which helps bring out the required skills.

The delivery mechanisms of the existing institutions for developing skills for green jobs remain weak. Shortage of skills and expertise largely explains the weak delivery mechanisms of these institutions. Generally, training in skills for green jobs takes place only informally.

Effective delivery of green skills would be in the vocational and higher education sectors and requires analysis of which green jobs are required, what knowledge and skills, and in what context. That analysis can only take place by sector and varies from one community to another since there is good evidence to suggest that the environment plays an important role in attracting and maintaining businesses in rural areas.

The special government support programme “Green Jobs Programme” has just been approved. It is aimed at creation of green and decent employment, enhancement of labour productivity, and reduction of poverty, and one of its activities is promotion of workplace re-skilling and skilling for the educated and uneducated.

4.3 Active Labour Market Programmes (ALMPs) and retraining measures

(including the role of employment service providers; which target groups of the population most need retraining and which benefit most from retraining and ALMP measures?)

In Uganda active labour market programmes have just been initiated. In a bid to make the City more liveable and inclusive for young people, the Kampala Capital City Authority (KCCA) has invested in youth programmes through the Employment Services Bureau. The **ICT** mentorship and skills development, and IServe youth voluntary flagship programmes have been designed to equip the unemployed youth with competitive skills that have given them an edge against the others in the volatile labour market (KCCA 2017).

The Employment Services Bureau's mandate is to address the high unemployment rate within the city through linking job-seekers with potential employers, job counselling, skills development and volunteer programmes. Its main objectives include provision of employment and labour market information to job seekers and employers and enabling young people to acquire employable skills.

4.4 The role of the private sector in skills training

(sectoral approaches, apprenticeship training, on-the-job training by enterprises for current workforce, existing support measures and incentives)

The private sector is also contributing to skills development through their agencies and associations. This is in a bid to provide specialized skills to address the gap in skills availability, especially in managerial and technical areas. Enterprise Uganda is one such agency supporting Government in realizing its objective of developing small and medium-scale enterprises. They do this through business training courses and advice. None of these skills is green.

4.5 The role of institutional set-up

(e.g. sector / industry skills councils and other sectoral bodies, inter-ministerial coordination, HRD councils / committees, public-private partnerships, etc.)

Uganda has no skills development strategy as a part of a coherent country policy response to climate change and environmental degradation. There is very little or no policy coherence, complementarity, relevance or coordination as such. No skills response strategies are incorporated into a wider greening policy agenda. Nor is there a coherent national strategy or policy targeting the skills needs for greening the economy. The national HRD strategy for provision of skills for a green economy is market-driven, not environmental-policy-driven. Social dialogue has no role in skills development in the green economy.

However, initial TVET is also considered instrumental in greening the economy. There is virtually no role for business management education and training in promoting sustainable entrepreneurship. Generic skills such as leadership, communication, problem-solving and so forth in skills provision for green jobs have proved to be crucial, especially in the case of NGOs. The existing education and training system, including general schooling, does not follow a strategy of "mainstreaming" sustainability and environment protection issues within the education and training system. However, although no explicit policy is in place, the government has introduced several chapters on environmental issues in pollution, adaptation and mitigation in the syllabuses of University students. In addition, the government is planning to widen the base of environmental education at the higher levels.

5. Annexes

5.1 Analysis of case studies

Case Study I: Tree Planting

In a unique show of solidarity six organizations came together in a partnership to plant trees. Uganda Breweries, National Broadcasting Services Television NBS TV, Standard Chartered Bank, Adeke's Farm and the Environmental Conservation Trust of Uganda, in collaboration with National Environment Management Authority (NEMA) convened and put their efforts and resources together to achieve this noble objective in an effort to conserve the environment. These trees were planted in Bwetamiiza Sub-Parish, Nabitalo Parish, Wakiso District. This is an investment of Ushs 25m and it will eventually see 3,000 trees planted. The ultimate objective of the project is to help contribute to the country's sustainable development through preservation and conservation of the environment. The planting was presided over by the Minister of State for Environment, the Hon Flavia Munaaba Nabugere. The partnership was commended for its efforts to mitigate environmental-degradation-related disasters and for its Corporate Social Responsibility. Given the tragedies that in the recent past have hit different parts of the Eastern and Western regions, all emanating from environmental degradation, this is one of the best examples of a Public-Private Partnership in which private organizations have worked with the Church, the National Environment Authority, the National Forest Authority and the community to execute the tree planting project, thereby leading the way in environmental conservation. It is important to ensure that environmental discipline is observed, and that there is no waiting for disaster to strike.

Uganda Breweries Limited was pleased to partner with other organizations and the local community in Nabitalo in this initiative, as a sign of their continued commitment to actively contribute to environmental conservation. Through their East African Breweries Limited Foundation, they have an employee-driven programme named E-green that is focused on environmental conservation through tree planting. Over the last five years the E-green team has planted over 500,000 trees in different parts of Uganda including Manafawa, Budaka, Mubende, Lugazi and Mbale. Uganda Breweries Limited in 2012 financial year had an ambitious target of planting 100,000 trees by June 2012 and through their partnerships they were optimistic that they will achieve their goal of protecting the earth which is the most important legacy they can leave for future generations.

Standard Chartered Bank Head of Corporate Affairs Mr Herbert Zake observed that protecting the environment is one of the Bank's main pillars in addition to creating access to financial services. The other Corporate Social Responsibility areas that the Bank addresses include youth, health and education. "The Bank's operational impact is less severe than many other businesses; nevertheless, they can make a difference by making their contribution towards protecting the environment" (Monitor Newspaper 2012). They have planted trees of indigenous species in different regions of Uganda, trees which should contribute positively to conservation of the environment as well as its biodiversity and to curbing degradation and the resultant calamities. Standard Chartered Bank undertook this for themselves and the future generation, and the Bank is here for the long term and for the progress of the communities.

The Head of Corporate Affairs NBS TV was very pleased to be a part of the partnership. NBS, under a campaign to plant 31m trees, has made a commitment to conserve the environment as one of its Corporate Social Responsibility activities. Under this campaign they have been

able to plant one million trees in various parts of the country since its inception in May 2010. The management and staff of **NBS** are very passionate about the communities in which the Bank operates and remain committed to do whatever it takes to safeguard these communities. This is evidenced by their own participation in the bank-driven and employee-driven community initiatives. The partnership aims to plant many more trees in other areas of Uganda.

In tree planting there is Youth Go Green Uganda, a registered non-government organization operating at national level, with a mission **to promote a green economy** through creation of green jobs that have become key drivers for achieving economic and social development that is also environmentally sustainable. The patron of Youth Go Green Uganda is the Rt. Hon. Rebecca Kadaga (Speaker of the Parliament of Uganda)

Youth Go Green Uganda is another organization which is operating in most districts of Uganda to promote green jobs, environmental conservation and agricultural programmes among youth through training, mind-set change and capacity-building to motivate and inspire action for youth in agriculture. They usually move from district to district training district leaders in environment conservation and other forms of training such as sensitizing them to HIV; these are shorter courses of 3-5 days. They are usually supported by the following partners: National Forest Authority, World Wide Fund, Uganda National Roads Authority and the Bank of Uganda. The funding from these organizations has supported the training and also the purchase of seedlings for planting. This has provided some basic skills in tree planting and also increased the number of trees planted. According to the most recent population census, Uganda has 34.9 million people, of whom 78 per cent are below 30 years of age, and 21 per cent are youth (18-30 years) (Uganda Bureau of Statistics 2013). Youth Go Green strives to improve environment conservation through tree planting, climate change mitigation and adaptation measures through provision of information, supply of agricultural inputs, lobbying and advocacy.

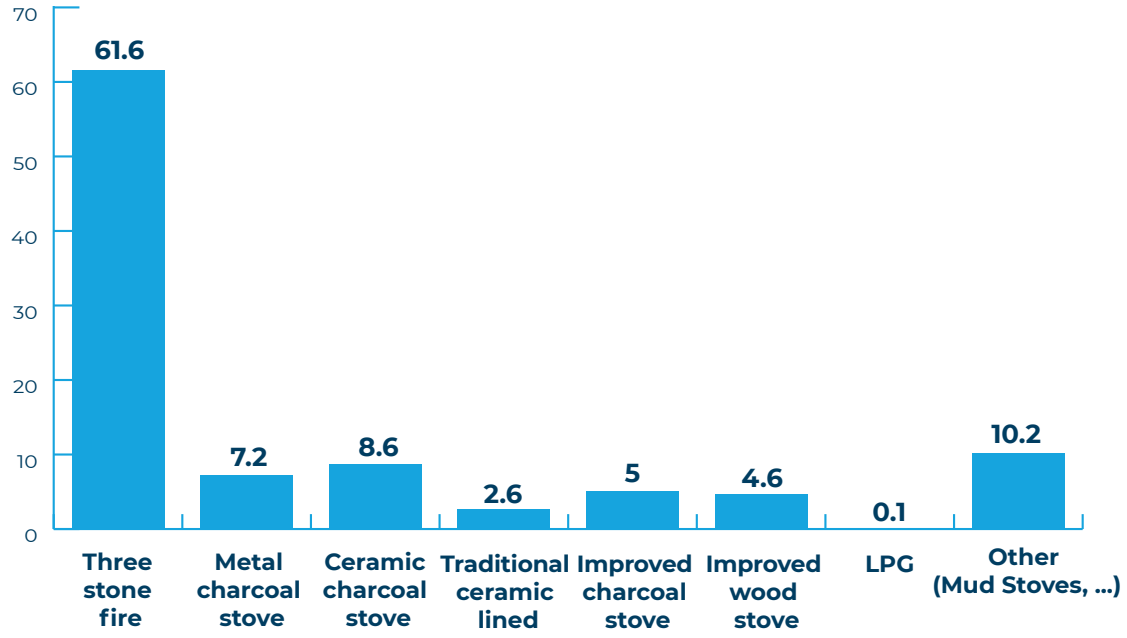
Youth Go Green also integrates agriculture development into the activities targeting youth and has been expanding its outreach programmes to position itself as a lead agency in advocating and advancing commercial agriculture and a climate-smart agriculture agenda for the youth who are the biggest population segment in Uganda, so as to create opportunities for them and tap into agricultural value chain innovations. The organization has a total membership enrolment of 500,000 youth across the country of which 58.9 per cent are female. These are organized according to the institutional regional coordination plan. Some of the skills farmers have been trained in include grafting, nursery management and intercropping. For instance, growing certain tree species as shade for certain crops such as coffee can be of help during dry seasons. Unlike crops, trees need tender care when young and it is advisable to establish them in a nursery. Farmers establish their own nursery as individuals or in groups in order to earn income from selling the seedlings.

Case Study II: Cooking Stoves in Uganda

In Uganda 94 per cent of rural households cook over an open fire; in urban areas, however, they cook on inefficient charcoal stoves. Poor families spend up to 15 per cent of their income on charcoal or wood. Searching for wood takes about six hours per day, time that cannot be spent on paid work. All of these factors increase poverty in Uganda.

On the other hand, about ten per cent of the population uses improved charcoal and wood stoves. Improved charcoal stoves, improved wood stoves and institutional stoves reduce fuel consumption by an average of 36 per cent, 58 per cent and 45 per cent respectively. In the last decade effort has been made to promote the adoption and continued usage of improved charcoal stoves (ICS) in order to reach the government target of 6.5 million households using efficient charcoal and wood stoves (MEMD) (2015).

Figure 2. The stove types currently used by most households



About six out of every ten of the households (61.6 per cent) use the three-stone fire, 8.6 per cent use the ceramic charcoal stove, and 7.2 per cent use the metal charcoal stove and others.

From efficiency studies conducted by GIZ, the improved charcoal stove has a cooking efficiency of 24 per cent compared to 15-17 per cent for traditional metal stoves. This means that the stove can save about 35 per cent of the fuel used by the traditional metal stove, and adoption of the improved stove results in a saving of 0.41 tonnes of charcoal by each user each year on average (MEMD) (2015). The efficiency of the improved charcoal stove depends on the ability to burn fuel completely, to transfer the resulting heat to the cooking vessel and finally to retain heat due to the insulation. These three qualities ensure a higher efficiency of the improved charcoal stove as compared to the traditional metal stove. Design improvements aimed at increasing the efficiency of the improved charcoal stove have to focus on these three characteristics. However, it should be noted that the overall efficiency of any cooking device is very much affected by the ability of the user to apply the device correctly. It follows that end-user training is key to the successful execution of ICS programmes on a large scale. The fabricators usually organise sensitization seminars on the proper use of these cooking stoves and it is usually free of charge. They also usually advertise in trade shows where people usually go to see some of the latest innovations in the various sectors. The major issues in the design of well-functioning cooking stoves relate to accounting for site-specific factors such as the pot, the fuel and the food to be cooked, and hence the need to adapt to local socio-economic conditions. For instance, in the rural setting on-site local construction of wood stoves allows the construction team to maximize performance by making design adjustments customised to addressing site-specific issues. On-site construction of stoves reduces transport costs and helps meet site-specific client needs. Many stove projects use resident artisans for the manufacture of this locally-made technology, and most have introduced specialist ceramic skills to enhance the stoves' functionality. These training courses are usually organized by the private sector with tailor-made training packages (curricula) which indicate the courses to be covered. These packages are not approved by the directorate of industrial training (DIT); they are non-formal training courses which admit all who want to be trained at a fee which

ranges between Ushs 200,000 (USD55) to Ushs 500,000 (US$ 140) for four weeks. This is lower-level training for Uganda which should be mainstreamed into industrial training for the time being but later can be mainstreamed into BTVET when the trainees will need to be Ordinary school certificate leavers for the lowest certificate training. Energising Uganda has trained more than 500 rural stove artisans since 2014 to produce and sell rural firewood stoves; this has been made possible by several new partnerships with other development programmes. The artisans have been linked to the partner organization's network to ensure sustainable growth of supply.

Production of improved biomass energy technologies (cooking stoves and fuels) is an income-generating activity capable of growing into a full-blown industry with well-known downstream benefits, employing thousands of youth and women. People trained should be assessed practically and those who pass are certified and are those who will be able to adhere to quality and other standards necessary for a thriving industry. A deliberate effort has to be made to attract large investments that will slowly bring on board the existing small-scale enterprises for aggregated, quality-controlled development. For instance, having small enterprises acquire production and distribution franchises from large producers can provide a win-win relationship that ensures that both do good business producing and selling good quality products to a satisfied customer base over the long term.

Cost price is one of the major factors influencing the decision by a household to acquire an ICS. In Uganda keeping the price of the improved cooking stoves low and affordable is still a challenge because of high production costs. Investment in skills development can make the product more competitive because it can lead to innovations, better products and a critical mass of better-trained technicians, and this can attract all types of clientele. Usually a decision for a household to purchase an improved stove can only be made after a thorough assessment of the benefits. MEMD has already taken steps to promote Renewable Energy Technologies (RETs) nationwide through trade fairs and the now popular Energy Efficiency Week. However, these initiatives have to be scaled up and conducted more regularly. The approach has to change so that improved cooking devices are promoted primarily for their health benefit in mitigating IAP (a paradigm shift). The strategy should involve the Ministry of Health taking centre stage to include the use of ICS in the mitigation of IAP among the key health enhancement messages for dissemination through health marketing.

6. Conclusions and recommendations

There has been slow growth in skills for green jobs in Uganda and the growth has mainly been in agriculture and energy. In agriculture there has been skilling in new farming practices, promoting the adoption of new crop and livestock enterprises, improving the adoption of modern agricultural production technologies and practices, use of post-harvest technologies and commercial marketing of commodities. In renewable energy, solar energy has held centre stage with around 15,000 solar engineers and technicians and 100 green entrepreneurs trained, mainly by the private sector. Uganda has developed several strategies and policies for greening the economy and they include the National Strategy and Action Plan to Strengthen Human Resources and skills to advance green, low emission and climate-resilient development in Uganda (2013-2022). The strategy proposes that investing in strengthening human capacities to integrate climate change in primary and secondary education is critical. The development of a skills development strategy for clean technologies is also crucial and the Cabinet has approved the implementation of a Green Jobs Programme under the Ministry of Gender, Labour and Social Development. When these measures are implemented they will have a high impact on skills development for green jobs. Labour market information for anticipating and monitoring skills needs for green jobs in Uganda is the critical starting point for effective policy cycles. This will enable government and businesses to anticipate changes in the labour market, identify the impact on skills requirements, incorporate changes into the system by revising training programmes, introducing new ones, and monitoring the impact of training on the labour market. These require both financial and human resources and we acknowledge the support mechanisms offered by development partners.

It is **recommended** that Uganda

i) introduces essential green skills into the core national curricula and professional development courses;

ii) provides a comprehensive assessment of employment demands and potential by sector including direct, indirect and induced job creation plus mapping of supply chain linkages;

iii) establishes a skills taskforce and skills board to identify the skills gaps for green jobs including identification of technical and vocational skills and associated reforms;

iv) assesses the skills needs for the Uganda government sectors;

v) creates and introduces tailored short and inexpensive vocational courses that fill gaps or adapt existing skills for lower-skilled jobs associated with reducing the impacts on the environment; and

vi) improves productivity and resilience by scaling up climate-smart agriculture practices to create resilient, high-yield and low-emission food and commodity production.

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