



International
Labour
Organization

Skills for Green Jobs in **Guyana**



Skills for Green Jobs in **Guyana**

Copyright © International Labour Organization 2018
First published 2018

Publications of the International Labour Office enjoy copyright under Protocol 2 of the Universal Copyright Convention. Nevertheless, short excerpts from them may be reproduced without authorization, on condition that the source is indicated. For rights of reproduction or translation, application should be made to ILO Publications (Rights and Licensing), International Labour Office, CH-1211 Geneva 22, Switzerland, or by email: rights@ilo.org. The International Labour Office welcomes such applications.

Libraries, institutions and other users registered with a reproduction rights organization may make copies in accordance with the licences issued to them for this purpose. Visit www.ifro.org to find the reproduction rights organization in your country.

Skills for Green Jobs in Guyana

ISBN 978-92-2-132913-8 (print)
978-92-2-132914-5 (web pdf)

The designations employed in ILO publications, which are in conformity with United Nations practice, and the presentation of material therein do not imply the expression of any opinion whatsoever on the part of the International Labour Office concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its frontiers.

The responsibility for opinions expressed in signed articles, studies and other contributions rests solely with their authors, and publication does not constitute an endorsement by the International Labour Office of the opinions expressed in them.

Reference to names of firms and commercial products and processes does not imply their endorsement by the International Labour Office, and any failure to mention a particular firm, commercial product or process is not a sign of disapproval.

Information on ILO publications and digital products can be found at: www.ilo.org/publns.

Table of Contents

Abbreviations and Acronyms	v
Abstract	vii
Acknowledgment	viii
1. Introduction.....	1
1.1 Objectives – Methodology.....	1
1.2 Key informant interviews.....	2
1.3 Focus groups.....	2
2. Major changes in the economy and employment shifts in the green transition.....	5
3. Key policies and regulations	9
3.1 International environmental agreements	9
3.2 National Legislation	9
3.3 Guiding Policies for Green Shift	10
4. Skills development measures for the green economy	15
4.1 Skills needs identification / anticipation	15
4.2 Education and training.....	20
4.3 Active labour market policies (ALMP) and retraining measures.....	24
4.4 The role of the private sector in skills training.....	32
4.5 The role of institutional set-up	36
5. Analysis of case studies.....	41
5.1 Micro and small enterprise (MSE) development and building alternative livelihoods for vulnerable groups.....	41
5.2 Bartica – Guyana’s green pilot and model green town	42
5.3 Education sector reform to support Guyana’s green programme: University of Guyana Science and Technology support project.....	45
5.4 Mangrove restoration project – sustaining alternative community livelihoods through improving coastal resiliency	47
5.5 Planning Guyana’s green energy transition	49
5.6 Skills training for climate smart agricultural adaptation and resilience.....	51
5.7 Institute of applied sciences and technology: green research and development.....	54
5.8 Conservation international – Rupununi innovation fund	55
6. Conclusions and recommendations.....	59
7. References.....	67
8. List of key resources	71
9. Annex	73
GEA engagement in awareness / capacity-building initiatives.....	73

List of Tables

Table 1. Unemployment Statistics 1999-2017	5
Table 2. Comparison of sex disaggregated data for 2002 and 2012	5
Table 3. Medium-term Macroeconomic Framework - GDP	7
Table 4. List of key findings by thematic topics and issues	16
Table 5. Education Sector Priority Areas Relative to Green Growth	19
Table 6. CCESD Priority Institutional Development Actions	21
Table 7. Facilitating Participation in Guyana's Green Economy by Priority Cohort	23
Table 8. Institutional Governance and Role in Green Transition	35
Table 9. Institutions Supporting Skill Development for Green Jobs	36
Table 10. Sector focus for loans and grants to MSEs	39
Table 11. Goals of Bartica LED Plan	40
Table 12. Employment created through the Mangrove Restoration Project	45
Table 13. Geographic spread of beneficiaries in the Rupununi Sub-region	53
Table 14. Breakdown of women-headed households in the Rupununi sub-region	54
Table 15. Recommended good practices and priority policy messages	56
Table 16. GRIF Investment to date - (in US\$ millions)	58
Table 17. Priority climate adaptation measures	61

Abbreviations and Acronyms

ADP	Amerindian Development Fund
ALMPs	Active Labour Market Policies
ASTM	American Society of the International Association for Testing and Materials
CANTA	Caribbean Association of National Training Agencies
CAPE	Caribbean Advanced Proficiency Examination
CARICOM	Caribbean Commonwealth
CARILED	Caribbean Local Economic Development Programme
CCESD	Climate Change Education for Sustainable Development
CI	Conservation International
CLC	Critchlow Labour College
CRG	Cooperative Republic of Guyana
CSC	Caribbean Examinations Council
CSR	Corporate Social Responsibility
EE	Energy Efficiency
EIS	Extractive Industries Sector
EU-FLEGT	European Union – Forest Law Enforcement, Governance and Trade
FAO	Food and Agricultural Organisation
FTCI	Forestry Training Centre Incorporated
GBDP	Green Bartica Development Plan
GBTI	Guyana Bank for Trade and Industry
GCF	Green Climate Fund
GDP	Gross-Domestic Product
GEA	Guyana Energy Agency
GESI	Gender Equality and Social Inclusion
GFC	Guyana Forestry Commission
GHG	Greenhouse Gas
GoInvest	Guyana Office for Investment
GSDS	Green State Development Strategy
GUYSUCO	Guyana Sugar Corporation
HCFCs	Hydro chlorofluorocarbons
HDI	Human Development Index
IADB	Inter-American Development Bank
IAST	Institute of Applied Sciences and Technology
IICA	Inter-American Institute for Cooperation on Agriculture
ILO	International Labour Organization
IPED	Institute of Private Enterprise Development
ISO	International Organization for Standardization
KII	Key Informant Interview

LCDS	Low Carbon Development Strategy
LED	Local Economic Development
LEED	Leadership in Energy and Environmental Design
LFS	Labour Force Survey
LMIS	Labour Market Information Systems
MNR	Ministry of Natural Resources
MoA	Ministry of Agriculture
MoU	Memorandum of Understanding
MRV	Monitoring, reporting and verification
MSE	Micro-Small Enterprise
NAREI	National Agricultural Research and Extension Institute
NCERD	National Center for Educational Resource Development
NDC	Nationally Determined Contributions
NDS	National Development Strategy
NMES	National Monitoring and Evaluation Strategy
OCC	Office of Climate Change
OLADE	Latin American Energy Organization
PRSP	Poverty Reduction Strategy Paper
PSC	Private Sector Commission
RE	Renewable Energy
READ	Rural Enterprise Agricultural Development Project
SIDS	Small Island Development State
SME	Small-Medium Enterprise
SNC	Second National Communication
STEM	(Science, Technology, Engineering and Math)
TERI	The Energy and Resource Institute
TVET	Technical and Vocational Education Training
UG	University of Guyana
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development

Abstract

Guyana is actively laying the foundation for its transition to a green economy. Through the ratification of the UN Framework Convention on Climate Change, and other multi-lateral environmental agreements, the country is demonstrating its commitment to improving its resiliency by adopting policy-driven mitigation and adaptation actions while simultaneously improving its capabilities to mitigate global climate change impacts.

The Government has developed national level legislation that provides a legal framework for public and private sectors to pursue the shift towards a green economy. This transition is requiring a qualified pool of professionals with new skillsets and expertise to drive green growth and meet anticipated labour market demands. The education sector within Guyana is readily responding in this regard. Both public and private education institutions, e.g. the University of Guyana and Technical and Vocational Education and Training (TVET), have carried-out extensive reviews and revisions of their curricula to better prepare graduates for the requirements of transitioning the economy and sustaining green growth.

Skills for green jobs in key sectors such as mining, forestry and agriculture have been prioritized due to environmental and climate change impacts they have. Moreover, Guyana is investing in skills for new green occupations, in priority areas including renewable energy, nature and eco-tourism and ecosystems services. It needs to be recognized that although a strong foundation is being laid and positive actions being demonstrated, more work is needed to fully align skills requirements and policy. An example of this is the need to produce time-series labour market information and to include labour policies in the green policy framework to ensure the labour response is data and policy driven. This report examines these and other findings.

The political leadership and collaborative action required cannot be overstated. At the national level, Guyana finds itself at experiencing two interlinked economic reforms, i.e. greening and moving toward a more knowledge-based, service oriented and value-added economy.

Considering the concentration of employment in urban and peri-urban coastal areas, well as higher poverty density rates in rural and hinterland Guyana, green awareness across Guyana's population complemented by localized knowledge of vulnerabilities and decentralized skills building linked to territorial green economic programmes are indispensable for national policies and programmes to improve livelihoods, protect lives and national assets.

This report is one of the studies underpinning the Guyana Decent Work Country Programme 2017-21 that ILO constituents, Government, Employers' and Workers' representatives have jointly developed. Together they hopefully contribute to the development of the Guyana Green State Development Strategy and facilitate a truly "just" transition to an environmentally sustainable economy and society for all.

Claudia Coenjaerts

Director

ILO Decent Work Team and Office for the Caribbean

Acknowledgment

This study was conducted by Dr. Rawle Andrew Small and Ms. Maria Witz, as a part of set of national studies on skills for green jobs conducted in some thirty countries globally. The set of studies is the result of collaboration between the ILO and the European Centre for the Development of Vocational Training (Cedefop). Overall methodological guidance was provided by Olga Strietska-Illina (ILO Employment Policy Department, Skills and Employability Branch). Coordination of country studies and technical backstopping was provided by a team led by Catherine Saget (ILO Research Department), Tahmina Mahmud (ILO Skills and Employability Branch) and Takaaki Kizu (ILO Research Department). Moustapha Kamal Gueye and Marek Harsdorff (ILO Enterprises Department) contributed to the studies' implementation on behalf of the ILO Green Jobs Programme. Alena Zukersteinova and Stelina Chatzichristou from Cedefop's Department for Skills and Labour Market coordinated studies among the participating EU countries. Valuable inputs were provided by the ILO colleagues: Christine Hoffmann, Laura Brewer, Maria Ilca Lima Webster, Alvaro Ramirez Bogantes, Hassan Ndahi, Fernando Vargas Zuñiga, Patrick Daru, Akiko Sakamoto, Mikhail Pouchkin, Gabriel Bordado, Julien Magnat, Kanae Tada, Tendy Gunawan, Bolotbek Orokov, Gwyneth Anne Palmos, Georginia Pascual, Badiane Cheickh and Kishore Kumar Singh. Massimiliano Leone, Ana Buzdugan (International Training Centre ILO Turin), Mariela Dyrberg and Annette Brandstätter (ILO Employment Policy Department) Solveig Boyer (ILO Green Jobs Programme) and Manuela Flamini (Edizioni Retrò s.r.l.) were responsible for editing and design.

1. Introduction

Guyana is laying a strong foundation in preparation for its shift to a green economy. In January 2017, Guyana finalized its Green State Development Strategy (GSDS) Framework, building upon the Low Carbon Development Strategy (LCDS) objectives, by strengthening policy and programmatic coherence through aligning its climate and environmental-resilient economic development framework to the Sustainable Development Goals (SDGs) of the 2030 Agenda on Sustainable Development. These policy measures have arisen in response to global threats of climate change and Guyana's economic inefficiencies, most notably its reliance on a few extractive natural resource commodities as principle sources of growth, livelihood security and employment. The country's response is to move to a fully sustainable and resilient economy that works to preserve natural resources, through an inclusive manner and supports decarbonized, resource-efficient and environmentally sustainable development. The LCDS and the GSDS Framework, respectively, are the most significant developments within Guyana's policy framework influencing the country's economic and labour market shift towards a greened economy.¹

Programmatic actions in sectors prioritized for greening are responding to regulatory, adaption and market requirements to remain viable, simultaneously contributing to incipient green growth. Both public and private education institutions, to include the University of Guyana and TVET programs, have carried out extensive reviews and revisions of their curricula to better prepare graduates for the requirements of the labour market as it shifts green. Moving forward, Guyana still has several challenges to address. The need for green growth labour market data

is one of the more pressing concerns. Currently, such data is insufficient but is very much needed so that academic, public and private sectors can develop and better coordinate their greening policies and programmes based on viable evidence. This Study will reflect on Guyana's experiences identifying, anticipating and responding to skills needs for green jobs as the country transitions to a green economy.

1.1 Objectives – Methodology

The ILO recognizes that to have an effective transition to a green economy, the right skills are required within the labour force. In 2011, the ILO produced a report entitled, Skills for Green Jobs: A Global View, which included cases of 21 countries. In 2017, the first study focusing on Guyana took place, which will be incorporated into the ILO's updated global report on Skills for Green Jobs, expected in 2018. This report further formed part of the analysis for the ILO World Employment and Social Outlook 2018 publication on 'Greening with Jobs'. The consultancy for the ILO, Skills for Green Jobs Study – Guyana, took place from 19 June 2017 to 30 September 2017.

The Consultant Team used a mixed-method approach to the research through use of primary and secondary sources for collecting both quantitative and qualitative data to respond to the following study objectives:

- a) Identify major challenges and priorities related to climate change by taking into account the Nationally Determined Contributions (NDCs) and the subsequent greening policies and strategies;
- b) Identify major sectors with a greening potential in the country and those particularly affected by green stimulus packages and programmes;
- c) Analyse whether and how skills response strategies are incorporated into larger 'greening' policies and programmes;

¹ Under the LCDS, the Environmental Protection Agency (EPA) was empowered to take on increased responsibility for oversight guaranteeing social and environmental safeguards are applied to all GRIF investments. Under the GSDS, the Department of the Environment was established in 2016. The Department of the Environment currently has oversight on the EPA, National Parks Commission, Wildlife Commission, and Protected Areas Commission.

- d) Analyse skills needs for new occupations, new skills for greening existing occupations and retraining needs in sectors undergoing structural changes as a result of policy implementation, and introduction of greening technologies and practices;
- e) Identify which methods, tools, systems and institutional frameworks for skills anticipation and assessment are in use to ensure the skills provision correspondence with current and future labour market demand for workers in transition to a greener economy, both quantitatively and qualitatively and at different levels, i.e. national, sectoral, regional, company, training provider;
- f) Analyse how the skills response is organized to effectively meet the challenge of greening the economy, paying specific attention to planning initial and continuing training, institutional frameworks, systemic provisions, delivery channels, ad hoc versus anticipated skills responses, and skills response by different actors and providers;
- g) Draw conclusions and policy recommendations for skills policies and strategies, skills provision at national, sectoral, local or enterprise level and further research needs to meet the demand of greening the economy in the country.

A broad range of data collecting methodologies were employed. These include a Literature Review, Key Informant Interviews (KIIs), and Focus Groups as explained below. Data quality assurance was done through triangulation.

A literature review was done of over 40 academic and professional level documents to include reports, studies, policy papers and such. These can be reviewed in the bibliography page, Annex A. An initial review was done to support the development of the interview guides for the KIIs and focus groups, as well as to feed into the case studies. During the data collection efforts, new documents were identified through dialogue with stakeholders and were used to build on the primary data collected through KIIs and focus groups.

In total, 116 persons were engaged through KIIs and focus groups. These included 47 persons working at 21 government entities, to include nine distinct Ministries; 16 persons at private sector organizations; ten persons from trade unions, associations and non-profits; ten persons from international organizations to include donors, multi-lateral banks, and implementing partners; and 33 persons from academic institutions. A full list of stakeholder organizations engaged can be viewed in Annex B.

1.2 Key informant interviews

The Consultant Team conducted KIIs with a variety of stakeholders to include government entities, private sector organizations, trade unions, associations, academia, non-profit organizations, international donors and multi-lateral banks. The KIIs were one-on-one interviews meant to gather the necessary information to enable qualitative and quantitative data to be collected to address the objectives of the study. At some organizations, there was more than one department that was relevant to the study, hence interviews were carried-out with more than one representative of the said organization. Semi- structured interview guides were developed for the KIIs. Each KII lasted from one to one and a half hours.

1.3 Focus groups

The Consultant Team had prepared for eight focus groups initially but due to scheduling conflicts of invitees, a total of five were carried out within Georgetown. Some focus groups comprised participants from a mix of stakeholder types brought together to discuss a specific topic and others included one type of stakeholder to have a more focused discussion relevant to their organization. Discussion guides were developed for each focus group. Each focus group had from four to sixteen

Skills for Green Jobs in Guyana

participants, and lasted from one and a half to two hours. The focus groups facilitated were:

Title: Green Growth in the Tourism Sector: The Business of Protecting Guyana's National Patrimony.

Aim: How greening tourism, in particular nature tourism, creates transferable green employment, skilled labour and awareness.

Title: Governance in Guyana's Primary Natural Resource Sectors: Agriculture, Forestry, and Mining.

Aim: Identify sector governance and labour connections including employment and skills gaps and opportunities.

Title: University of Guyana, Faculty of Earth and Environmental Sciences (FEES) Students: Views on Curriculum Changes and Preparation for Employment in Green Sector.

Aim: In light of the recent World Bank project in which the FEES curriculum was revised to better prepare students for the labour market as it shifts green, this focus group sought to get the view of the students on the old versus new curriculum, as well as to discuss if they felt prepared for the current labour market as it shifts green.

Title: Gender and Social Inclusion (GSI) in the Context of Skills Development for Guyana's Green Economy.

Aim: Identify level of engagement in Guyana's current green economy, as well as opportunities for increased participation, based on identity factors.

Title: Creating Green Employment Opportunities: Ecological Services and Sustainable Rainforest Management.

Aim: Employment creation through the provision of ecological services and rainforest conservation.

In order to guarantee equitable representation across demographics and assess greening efforts country-wide, where the Consultant Team was not able to travel due to flooding, transportation or other barriers, the following methods were utilized:

- a) Representatives from the region, or working on issues directly relevant to the region, were invited to join in focus groups and/or KIIs in Georgetown;
- b) KIIs were conducted utilizing skype or telephone;
- c) Utilized secondary data through a literature review of documents relevant to the regions.

2 Identity Factors refer to attributes of an individual or community such as one's sex, age, socio-economic status, education, literacy, ethnicity, disability, religion and so forth. Some of these identity factors can be the reason for a person and/or community being in a position of vulnerability and marginalization. It is critical to note that none of these identity factors are in a silo.

There is intersectionality among all of them and not one identity factor fully represents an individual and/or community.

Furthermore, to bring in a diverse and equitable representation of views, the Consultant Team considered identity factors² throughout the design of data-collecting and analysis tools.

The main challenges experienced during data collection were:

- a) During the consultancy time period, many stakeholders were out of the office or focused on internal work, such as budget reporting, therefore were not able to be engaged;
- b) Much of the requested data does not exist as there has not been a holistic effort to capture and manage data relative to greening Guyana's economy; and
- c) Information request at times proved to be a challenge where stakeholders were not willing to share information or simply did not respond to the request.

² Identity Factors refer to attributes of an individual or community such as one's sex, age, socio-economic status, education, literacy, ethnicity, disability, religion and so forth. Some of these identity factors can be the reason for a person and/or community being in a position of vulnerability and marginalization. It is critical to note that none of these identity factors are in a silo. There is intersectionality among all of them and not one identity factor fully represents an individual and/or community.

2. Major changes in the economy and employment shifts in the green transition

The United Nations Development Programme (UNDP) Human Development Report (2016) notes that Guyana's Human Development Index (HDI) value increased from 0.541 to 0.638, a 17.9 per cent increase during the period 1990 to 2015.³ During the first decade of the 21st century, Guyana's external debt burden was mitigated as a result of substantial write-offs the country achieved under the Highly Indebted Poor Country initiatives, Multi-lateral Debt initiatives and from restructured debt servicing with the Paris Club. Reforms triggering this reduction in the country's debt burden centered on reducing fiscal expansion in the public sector, increasing economic competitiveness through pro-growth policies and investments, and poverty reduction and social development programmes (e.g. *Social Impact Amelioration Programme, Basic Need Trust Fund, Poverty Reduction Strategy Paper*)⁴. Furthermore, the report recorded cumulative improvement in all measurements, e.g. life expectancy increased by 3.0 years, mean years of schooling increased by 1.6 years and per capita Gross National Income increased by approximately 210 per cent. From 2000 to 2010, extreme poverty declined from 30 per cent to 18.6 per cent, compound annual GDP was recorded at 2.3 per cent. In 2015, the World Bank updated Guyana's classification from low income to middle income country. By 2016, per capita GDP was recorded by the International Monetary Fund at US\$ 4,475. In its 2014 Millennium Development Goals Status Report for Guyana, the UNDP reported that Guyana either met or exceeded each indicator covering MDG goals 1-7, excluding universal primary education for which Guyana's status was "on track to achieve."

3 Human Development Report - Human Development for Everyone Briefing note for countries on the 2016 Human Development Report - Guyana. 2016. Pg. 2.

4 The five pillars of Guyana's PRSP (2011) are: (i) broad-based, low carbon led job creation for economic growth; (ii) stronger governance in institutional, and regulatory structures; (iii) accelerated investment in human capital, and primary health; (iv) accelerated investment in physical infrastructure in support of growth strategy; and (v) special intervention programmes to address regional and demographic pockets of poverty.

The report acknowledged Guyana's compliance with goal #8, but noted the weakness of national monitoring and evaluation systems.

Guyana's employment rates during this growth period indicate marginal and concentrated employment trends. Official unemployment figures during the period 1999 to 2017 are available via the following sources: (a) 1999 – Household Income and Expenditure Survey, (b) Population and Housing Census - 2002, (c) Household Budget Survey - 2006 and (d) 2012 – Population and Housing Census.

Despite economic growth, the unemployment rate during 2002 with GDP at 1.2 per cent, and in 2012 after successive years of strong GDP performance, both measured at 12.5 per cent. A mix of contributing factors are likely, in 2002 Guyana's total labour force was 231,288 compared to an increase of 244,835 in 2012. The total number of unemployed persons in 2002 and 2012 also increased by 2,033 persons. The figures above show that Guyana's experience with economic productivity did not necessarily translate to sustained, broad-based job growth as the economy was unable to absorb a marginal increase in the active labour force. This was most likely due to job growth concentrated in traditional sectors such as agriculture, forestry, mining, and narrow value chains, which is indicative of limited value-added production.⁵ Table 3 compares labour force data for 2002 and 2012 in Guyana disaggregated by sex.

In 2009, Guyana established its LCDS oriented towards sustainable economic growth and job creation within the framework of a low carbon, climate resilient and sustainable diversified economy. Guyana's National Climate Change

5 During the period covered (2000-2012) commodity prices for gold increased from US\$ 465 to US\$ 1,911 per ounce, triggering increased local and foreign investment. Additionally, the Ministry of Finance notes that Guyana's services sector share of GDP continues to remain above 40 per cent. There were at least three large business processing outsourcing investments during the period 2000-2012.

Table 1. Unemployment Statistics 1999-2017

Item	SOURCE: HOUSEHOLD INCOME AND EXPENDITURE SURVEY	SOURCE: CENSUS	SOURCE: HOUSEHOLD BUDGET SURVEY	SOURCE: CENSUS
	UNEMPLOYMENT % (1999 / 2000)	UNEMPLOYMENT % (2002)	UNEMPLOYMENT % (2006)	UNEMPLOYMENT % (2012)
	9	12.5	10.7	12.5
Average GDP (%)	(1999-2001) 2.23		(2002-2006) 2.12	(2007-2012) 4.48

Table 2. Comparison of sex disaggregated data for 2002 and 2012

INDICATOR	2012		2002	
	Number	Rate (%)	Number	Rate (%)
Males				
Total population, 15 years and over	247,583	100	230,947	100
Total labour force	191,077	77.2	182,575	79.1
Employed	170,905	89.4	162,926	89.2
Unemployed	20,172	10.6	19,649	10.8
Not in labour force	56,506	22.8	48,372	20.9
Females				
Total population, 15 years and over	256,742	100	237,931	100
Total labour force	88,722	34.6	81,644	34.3
Employed	73,930	83.3	68,362	83.7
Unemployed	14,792	16.7	13,282	16.3
Not in labour force	168,020	65.4	156,339	65.7

Action Plan (2002) adjoined an adaptation, mitigation and resiliency framework to its National Development Strategy (NDS) (2001-2010). The LCDS thus incorporated both national development and climate appropriate development priorities which noted inter alia that climate change posed significant risk to economic resiliency, institutional capacity to respond to climate risks and emerging impacts, livelihood security and budgetary expenditure. It articulated an economic value on Guyana's global climate mitigation services, in particular its forest carbon services, and sought to expand and develop the socio-economic value of other ecosystem services of value to its citizens and the international community. Guyana's small economic base and historical dependence on

extractive industries, agriculture and forestry sectors is well documented.⁶ Further economic growth is commodity-based and export-dependent, which makes investment and employment highly vulnerable to global market volatility and hydrologic variability e.g. changes in preferential trade prices for sugar and rice mainly, and flooding and drought risks.⁷ In January 2005

⁶ Agriculture, forestry, fishing and mining industries accounted for 28 per cent of total GDP. Forestry, mining (gold and bauxite) and agricultural exports comprised 83% of exports in the same year. These sectors are also large source of jobs. Ministry of Finance. 2017

⁷ Real economic activity expanded by 3.3 per cent in 2016. Subdued agricultural commodity prices, adverse weather and delays in public investment weighed down on activity, while large increases in gold output helped support growth. International Monetary Fund Article IV Consultation and Country Report – Guyana. 2017. Pg. 1

Skills for Green Jobs in Guyana

a devastating flood cost Guyana an estimated US\$ 465 million in flood related damage, equivalent to 60 per cent of the country's GDP.⁸ Increasing impacts and variations of hydrologic (i.e. drought, unseasonal rainfall patterns and water accumulation in historically flood resilient areas) phenomena are also being experienced in Guyana's rural coastal and hinterland areas inland where the poverty gap is 14.7 per cent and 46.1 per cent respectively; the national average is 16.2 per cent.⁹

Building on its experiences implementing the LCDS, Guyanese policymakers have prioritized national adaptation and mitigation actions across sectors to increase the economy's resilience to climate change, enhance natural resource-use efficiency, and protect and promote the socio-economic well-being of its citizens. Guyana's population according to most recent census estimates is 746,995. Between 85 and 90 per cent of Guyanese live along the country's coastline, approximately seven per cent of the country's 214,970sq. km. The coastline is a major hub for agricultural activity, commerce, finance, social and public services. Data from the Office of Climate Change (OCC) - Finance Division suggests that approximately 75 per cent of economic activities are located along Guyana's coastal zone. At high tide, Guyana's coastline experiences a median depth of 2.5 meters below median sea level. Sea level rise in Guyana for the period 1951-1979 was 10.2mm, just over five times the global average for the same period.¹⁰ Further, Guyana's Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC)¹¹ noted a 1.0 0C of mean annual temperature increase in the last century. By the end of the 21st century, the report states that temperature increase could reach 4.0 0C.

Guyana's GSDS Framework (2017) encapsulates the principle objectives of environmental sustainability, climate mitigation services and decarbonized growth recognizing the risks of hydrologic variability on citizens' livelihoods and its economy. Its stated objective notes:

"The objective of the strategy is to reorient and diversify Guyana's economy, reducing reliance on traditional sectors and opening up new sustainable income and investment opportunities in higher value-adding and higher growth sectors."¹²

The socio-economic objectives and targets within Guyana's updated Poverty Reduction Strategy Paper (PRSP 2011) are incorporated in the GSDS Framework Vision 2030 statement which shares the same spirit of the 2030 Agenda for Sustainable Development. The GSDS Framework's seven thematic areas are: green and inclusive structural transformation, sustainable management of natural resources, energy – transition towards renewable energy, resilient infrastructure and spatial development, human development and well-being and international cooperation, trade and investment.

The GSDS will guide Guyana's socio-economic investments and development path in the medium to long terms during which time its economy is expected to experience modest annual growth. The following figures reported by the International Monetary Fund Article IV Consultation and Country Report – Guyana (2017) projects economic and labour market stability over the medium-term, with job growth mostly aligned to Guyana's emerging oil and gas industry.

This trend indicates short to medium term labour market volatility will remain relatively stable. However, it also points to minimal job growth, in particular job growth aligned with greening the economy. Petroleum investments are expected to generate increases for direct and indirect employment through the provision of services connected to the emerging oil and gas industry. According to the Census (2012) Guyana's total labour force is 271,728 persons. Labour force

8 ECLAC: Guyana Macro-Socio Economic Assessment of the Damage and Losses Caused by the January-February 2005 Flooding. Pg. 26. 2005.

9 Guyana Poverty Reduction Strategy Paper (2011). P5. 9.

10 Impacts of Climate Change on Guyana and the World at Large. Part 1. Pg. 3. Consulted at: <https://www.lcds.gov.gy/index.php/documents/climate-change-information/understanding-climate-change/15-understanding-climate-change-part-2-impacts-of-climate-change-on-guyana-and-the-world-at-large-part-1-observed-climate-change/file>

11 Guyana became a signatory to the UNFCCC in 1992 and gained ratification in 1994.

12 Guyana Green State Development Strategy Framework, 2017. Pg. 6.

Table 3. Medium-term Macroeconomic Framework - GDP**GUYANA: MEDIUM-TERM MACROECONOMIC FRAMEWORK¹³ – GROSS DOMESTIC PRODUCT**

	Projected						
	2016	2017	2018	2019	2020	2021	2022
Real GDP	3.3	3.5	3.6	3.7	38.5	28.5	2.8
Non-oil real GDP	–	3.5	3.6	3.7	3.7	3.9	3.9

participation rate was recorded as 88.3 per cent indicating that 31,763 or 11.7 per cent of Guyana's working age population were unemployed.¹³

An alarming finding by the Labour Force Intelligence Survey (2017) noted that skills emigration driven by underemployment, low wages and social factors continue to adversely affect labour supply and skills shortages.

Some studies estimate that an average of 70-80 per cent of tertiary level graduates emigrate annually, the highest per capita capital flight in the Caribbean Commonwealth (CARICOM). A 2014 Inter-American Development Bank (IADB) report estimated that 43 per cent of secondary school graduates and 89 per cent of university graduates emigrated during the period 1980-2012, the equivalent of 9.5 per cent of Guyana's GDP per annum factoring education costs over the period 1980-2012.¹⁴

The GSDS posits that two major shifts are required to transition Guyana to an inclusive green economy: these are economic diversification towards increased value-added outputs and productivity balanced with environmental security and societal transformation which speaks to inclusivity and participation across political, geographic and ethnic lines. In the broader socio-economic context of the GSDS Framework, Guyana has initiated policy reforms and actions in the education, energy, agricultural, environment,

extractive industries, labour market and financial sectors *inter alia*. The International Monetary Fund notes that as Guyana concludes its GSDS green paper scheduled for 2018, the country must ensure macroeconomic stability, strengthen financial stability and pursue inclusive, broad-based growth to reduce risks of adverse labour market and economic volatility.

13 International Monetary Fund Article IV Consultation and Country Report – Guyana. 2017. Pg. 33

14 Guyana's 2012 Population Census: Runaway brain drain rules. Thomas, 2014. More information available at: <http://www.stabroeknews.com/2014/features/08/10/guyanas-2012-population-census-runaway-brain-drain-rules/>

3. Key policies and regulations

The economic and labour market impacts resulting from Guyana's green shift referenced in section 2 are both guiding and being guided by legislative and policy frameworks. Guyana's commitment to shifting to a green economy starts with its Constitution, Article 2:

“Article 2:25 Every citizen has a duty to participate in activities to improve the environment and protect the health of the nation.

Article 2:36 In the interest of the present and future generations the State will protect rational use of its fauna and flora, and will take all appropriate measures to conserve and improve the environment.”¹⁵

This constitutional foundation has laid the groundwork for Guyana's commitment to key multi-lateral environmental agreements subsequently supported by national legislation, which guides policy and strategy development for green growth of the country's most fruitful economic sectors.

3.1 International environmental agreements

Guyana's ratification of the UNFCCC in 1994 has guided a substantial part of the country's policy and economic direction taken since. To support the realization of their commitment to UNFCCC, Guyana developed a Climate Change Action Plan (CCAP) in 2001 which incorporated climate change in its national development paradigm. In compliance with Article 2 of the Conference of Parties 21 (COP 21) under the UNFCCC, Guyana developed their Intended Nationally Determined Contributions (INDCs), the first INDC which they did in 2015.¹⁶ Prior to

this, two national communications to UNFCCC were submitted in 2001 and 2012. Guyana's INDCs focused on reduction of carbon dioxide through policy, measures and actions comprising both conditional and unconditional proposals related to the agriculture, energy and forest sectors.

In 2003, Guyana ratified the Kyoto Protocol, the United Nations Convention on Biological Diversity in 1994, the United Nations Convention to Combat Desertification in 1997 and the Paris Agreement in 2016. Guyana's international pledges are influencing local policies, collectively they are fostering national greening regulations and guidelines impacting skills and operational needs across sectors.

An illustrative example is demonstrated through Guyana's commitment to the Montreal Protocol, of which they became a signatory in 1993. In compliance with the Montreal Protocol, Guyana, with the support of UNDP, implemented the Hydro chlorofluorocarbons (HCFC) Phase-out Management Plan (2012-2016). The plan brought together policymakers, businesses, technicians and trainers to eliminate all HCFCs in Guyana by 2030. The components of the plan include: (i) technicians training on good practice, recovery, reuse and retrofitting alternatives and (ii) collaborate with technicians, businesses and institutions to establish a system to recover and reuse refrigerants. Furthermore, training was provided to the enforcement arm of the Customs and Trade Administration to ensure that Guyana maintains compliance.

3.2 National Legislation

Foundational policies and legislation

Guyana's NDS (2001-2010) and CCAP helped lay the foundation for its landmark LCDS and current planning for its green transition. The NDS articulated a long-term series of poverty reduction, socio- economic improvements

¹⁵ Constitution of the Co-operative Republic of Guyana Act, 1980. <http://parliament.gov.gy/constitution/>

¹⁶ Government of Guyana. Guyana's Revised Intended Nationally Determined Contribution. UNFCCC, 2015, www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx. Accessed 30JUN17.

and pro-growth priorities to move the country forward specifically speaking to education reform with an increased focus on science and technology, economic diversification, and increased focus on attracting investment and building institutional capacity within the country.

The Forest Act of 2009 is another significant piece of legislation supporting Guyana's global commitment to mitigate the effects of climate change. This Act focuses on sustainable forest management, specifically speaking to: *"preservation of forests for the purpose of carbon sequestration or any other forms of environmental services; conservation of biological diversity; and ecotourism"*.¹⁷ Other key environmental legislation supporting Guyana's shift to a green economy can be viewed in Annex C.

Likewise, in support of Guyana's commitment to the multilateral environmental agreements working to mitigate the effects of climate change, the Government prepared in 2015, the Climate Resilience Strategy and Action Plan (CRSAP). The CRSAP laid out a road map for Guyana until 2020, which identified climate resiliency actions across 15 sectors. The following projects were prioritized for initial funding:

1. Building Climate Resilient Agricultural Systems,
2. Guyana's Sea Defence Enhancement and Maintenance,
3. Public Health Adaptation to Climate Change, and
4. Strengthening Drainage and Irrigation Systems.

All projects will work to increase employment and require new skills training to grow a qualified pool of professionals to support the implementation of projects.

All such legislation being developed points to the need for increased monitoring for compliance. This will not only increase employment opportunities across sectors, but will also require training on understanding the legislation and the proper monitoring processes.

3.3 Guiding Policies for Green Shift

Strategies

The LCDS and the GSDS Framework, respectively, are the most significant developments within Guyana's legal framework influencing the country's economic and labour market shifts towards a green economy.¹⁸ Guyana's LCDS was an initiative launched in 2009¹⁹ to move the country towards low carbon, climate resilient, and low deforestation economic growth.

Two main goals of the LCDS were: 1. Transforming the economy to deliver greater economic and social development by following a low carbon development path; and 2. Providing a model for the world of how climate change can be addressed through low carbon development in developing countries, if the international community takes the necessary collective actions, especially relating to Reducing Emissions from Deforestation and Forest Degradation Plus (REDD+).

Policy discourse and action around the LCDS, including the implementation architecture, prioritized the first objective of environmental security, conservation and capitalization of forest assets. The approach to realizing objective two summarized initial low carbon transformation in terms of modernization of traditional economic industries (sugar, rice, gold mining and forestry) and expansion to grow comparatively advantageous sectors such as aquaculture, manufacturing, non-traditional agriculture, business process outsourcing and information technology and tourism.

The LCDS was framed within the rubric of capitalizing Guyana's forest carbon services to steer transformation of the economy along a low carbon, environmentally sustainable, value-added path. The LCDS occasioned a number of milestones including the world's first bilateral payment for Reducing Emissions from Deforestation and Forest Degradation (Guyana

¹⁷ Forest Act of 2009 (Act #6 of 2009). Page 9.

¹⁸ See earlier reference at footnote 1.

¹⁹ President from 1999 to 2011.

Skills for Green Jobs in Guyana

REDD+ Investment Fund – GRIF) mechanism. Within this framework, the World Bank as Trustee and a number of Partner Entities were established to facilitate payment transfers and technical operational assistance. The Kingdom of Norway pledged up to US\$ 250 million to the GRIF to: (i) implement the LCDS and (ii) improve governance and implementation of reduced emissions and forest degradation targets. Ostensibly, transitioning to a low-carbon economy implied inter alia, reduced greenhouse emissions from economic activities, improved environmental safeguards across sectors and labour market changes linked to emerging and reoriented occupations.

Guyana has employed GRIF resources to implement policy measures to expand and strengthen environmental services, restructure priority economic sectors and develop a capable and prepared labour force. A few examples of these actions which are elaborated upon in subsequent sections of this report include:

- ▶ Guyana's Education for Sustainable Development Policy;
- ▶ Curricula revision at the University of Guyana and Secondary School levels;
- ▶ Climate change and audience-specific environmental awareness programmes within schools and throughout the local government system;
- ▶ Climate smart agriculture training;
- ▶ Enhancing technical capacities and training for conversion of the power sector to 100 per cent renewable sources;
- ▶ Capacity-building and start-up financing for green micro and small enterprise development;
- ▶ The Green Bartica Development Strategy;²⁰ and
- ▶ Consolidation and diversification of Guyana's sugar industry.

In January 2017, Guyana finalized its GSDS Framework building upon the LCDS objectives

by strengthening policy and programmatic coherence by aligning its climate and environmental resilient economic development framework to the SDGs of the 2030 Agenda on Sustainable Development. The GSDS Framework interprets and expands the link between environmental capitalization and low carbon development. Concurrently, it signals a policy shift towards a localized economic model and development programme that measures annual carbon emissions and GDP, but in addition places priority on social cohesion and inclusion in support of Guyana's socio-economic advancement. It lays the foundation to fully develop the GSDS that will guide Guyana for the next 15 years in sustainable economic, social and environmental development. It frames Guyana's efforts to fully transition to a green economy, and does so by putting in place the needed institutional structures and legal framework. The expected completion date for the GSDS is April 2018.

The GSDS Framework lays out Guyana's aims to realize green economic growth through diversifying their economic base, accessing new markets and creating jobs, with a focus on oil, gas and agriculture sectors. The approach is focused on four crucial facets:

- 1) Resource extraction for sustainable development;
- 2) Sustainable, productive, climate-resilient and diversified agriculture;
- 3) Green, inclusive, high value-adding industrial development;
- 4) Enabling business environment.

The GSDS expands environmental sustainability as a function and responsibility of the state, private sector, each citizen and all economic sectors. Moreover, it will significantly impact the economic planning and restructuring, thus affecting job creation and reorientation, and ultimately skill requirements.

In support of the targets laid out in the GSDS Framework, hence in support of the country's commitment to UNFCCC, Ministries are aligning their strategic plans and actions. As an example, the Guyana Energy Agency (GEA), within the Ministry of Public Infrastructure, developed a

²⁰ The Green Bartica Development Strategy is Guyana's first municipality-based Green Development Plan. The CRG has designated Bartica a model green development town that will serve as a pilot location and lead for greening initiatives at the regional and municipal levels.

Strategic Plan for 2016-2020, which lays out a path to reach the target of 100 per cent shift to all renewable energy usage by 2025. They will do this through increased regulation that limits the use of fossil fuels and increases the use of renewable energy. Such a significant shift in policy to regulate the use of fossil fuels and aim to transfer to 100 per cent renewable energy will drastically affect industries, thus occupations and skill requirements. Section 5 includes a Case Study looking at Guyana's Energy Transition, which will speak more specifically to such changes happening in the energy sector.

A similar response is demonstrated through the Ministry of Agriculture's 2013-2020 National Strategy for Agriculture, where they laid out a roadmap to address the challenges climate change is presenting to the agriculture sector, as well as needed restructuring to support greening of the sector. Additionally, the Ministry established the Mangrove Action Plan (2010-2012), and in coordination with the Civil Defence Commission (CDC), and UN Food and Agriculture Organization (FAO), developed Guyana's Disaster Risk Management (DRM) Plan for the Agriculture Sector, 2013 to 2018. The case studies of, 'Skills Training for Climate Smart Agricultural Adaptation and Resiliency' and 'Mangrove Restoration Project-Sustaining Alternative Community Livelihoods through Improving Coastal Resiliency' (Section 5), will elaborate on how such policies and strategies are affecting employment and skill needs within this sector.

Another illustrative example of how the GSDS will support green growth can be seen within the Green Bartica Development Plan. Section 4.3 provides more details summarizing how the plan incorporates environmental sustainability, natural resource efficiency, economic circularity and green growth as its baseline, guiding principles and overall outcomes. Furthermore, it constitutes a pilot strategy to update and green Guyana's towns, regions and districts.

Institutional management

The OCC, established in 2009, was initially the lead agency responsible for managing the realization of the LCDS. Of note, the OCC acted as the Secretariat for the Green Multi-stakeholder Committee.

Under the Government's new institutional set-up, the Department of Environment which is also within the Ministry of the Presidency, is the lead implementing and coordinating body of Guyana's green development.

In support of managing GRIF funds, the REDD Secretariat was originally based within the Guyana Forestry Commission, and mandated to be the implementing agency, but under the new administration, the responsibility for the GRIF has been transferred to the Project Management Unit within the Ministry of the Presidency.

Stakeholder participation in the national institutional arrangement

Government facilitated social dialogue²¹ continues to be the principle mode of public engagement on the GSDS, a similarity found in the LCDS consultations. However, a notable lesson applied in expanding the LCDS to greening the economy, is prioritisation of Guyana's local government architecture as a vehicle to decentralise and diversify public engagement activities.

The LCDS went through several iterations that involved in-depth consultations with a wide range of stakeholders. In the initial phase, a multi-stakeholder Steering Committee was established to monitor the process that engaged private and public stakeholders during a 4-month and a 3-month consultation process, respectively. This level of consultation will continue throughout the implementation of the GSDS. The development of the GSDS has been a fully participatory process beginning with initial consultations in December of 2016²² and most recently through those that took place in January 2017 resulting in the GSDS Framework.

21 Social dialogue is a means of negotiation, consultation and information sharing related to economic and social policy that can be a tripartite or bipartite process between and among representatives of government, labour and employers from the local to the national level. Social Dialogue: Finding a Common Voice. ILO.

22 These consultations included meetings with government officials (from 12 different ministries and/or public agencies); the private sector (13 associations and organizations); civil society (13 organizations) and bilateral agencies, among other key stakeholders.

Skills for Green Jobs in Guyana

Seven expert stakeholder groups were engaged throughout the development process. Additionally, there is a Green Multi-stakeholder Committee which includes representatives from government, private and non-profit sectors that will have monthly meetings. The inter-ministerial committee established under the LCDS is continuing in support of the GSDS. The GSDS team will coordinate with local government namely through the Ministry of Communities and the NDCs, where the networks and mechanisms to reach communities already exist. During the consultations, all stakeholders were able to provide input on their needs, as well as review the GSDS Framework during each stage of development to provide feedback. These stakeholders will continue to be engaged in dialogue as the GSDS Framework moves forward to finalizing the GSDS. Nationwide consultations will be carried out beginning in October 2017.

The Government of Guyana, with support of UNEP and the UN Country Team, will continue the same in-depth participatory consultation process for the finalization of the GSDS, which will include a full sectoral analysis of priority areas named in the GSDS Framework. Further, the final elaboration process will expand expert and thematic groups consulted during the GSDS framework exercise. Guyana's local government system will be tasked with fostering community and regional awareness and transmitting citizen inputs.

This level of social dialogue and civil society engagement is critical to creating the space and facilitating inclusivity as the economy shifts green.

4. Skills development measures for the green economy

Guyana has not yet incorporated labour policies in its green policy framework. This gap is linked to inefficiencies with the country's Labour Market Information Systems (LMIS) and the absence of labour market mechanisms within the architecture of its green transition agenda. Collectively this contributes to a scarcity of labour market statistics and analyses, and multi-stakeholder policy engagement on labour market issues in response to greening and restructuring its economy. There are however a number of national and sector level inferences than can be made and actions analysed, by assessing the framing of labour market concerns in the overall policy framework and emerging experiences respectively.

At the national level, the Government, in collaboration with its bilateral and multilateral partners, is investing in institutional strengthening and human capacity development within the national architecture supportive of policy cohesion and management, resource mobilization and technical skills aligned to fulfilling its international provisions (e.g. including monitoring, reporting and verification (MRV) requirements under the GRIF inter alia) and economic programmes for priority green growth sectors. Expansive education reform to improve Science, Technology, Engineering and Math (STEM) and Climate Change Education for Sustainable Development (CCESD) academic, technical and vocational competencies and awareness that its economy will need to transition and sustain a green, climate-resilient and more complex economic structure is being supported by investments totaling approximately US\$ 30 million from 2015 to 2017 as reported in section 4.2.

In the private sector, there are a handful of emerging skills training approaches and interventions, many of which are collaborative engagements with the central Government and public sector agencies. Financing tied to skills training for vulnerable groups especially,

is emerging as a key strategy in addressing the need for low-cost investment financing and skills for green growth. Through its partnership with The Energy and Resource Institute (TERI), the Private Sector Commission (PSC) is helping local businesses to assess their comparative advantages, opportunities and corresponding skills requirements for increasing circularity, greening operations and expanding value chain capabilities.

4.1 Skills needs identification/anticipation

Labour market priorities for economic restructuring and green growth

Designing an enabling environment to mitigate labour market volatility

A number of inferences can be drawn from the GSDS Framework to summarize the Government's strategies for addressing emerging labour force vulnerabilities and skills requirements. The first guiding principle of the GSDS Framework is social cohesion and inclusion.²³ Inclusiveness for Guyana's green shift is characterized in the GSDS Framework document by access to skills, participation in the green economy and equity in the distribution of derived benefits and opportunities. The Government's overarching response to economic and labour force restructuring is premised on the following objectives: (i) an economy characterized by value-added goods and services, resource productivity, improved environmental services and resilience to shocks and (ii) stable and inclusive growth. Considering

23 "Social cohesion and inclusion: human rights, multi-ethnicity and gender equality, non-discrimination and protection of vulnerable and marginalized population groups." Pg. 9.

inter alia, the historical dependence of its labour force and economy on a handful of commodity exports for employment and growth, identifying and meeting the skills requirements for a labour force in transition is a major policy concern.²⁴

The GSDS Framework values guiding Guyana's economic restructuring are grounded in the ethical safeguards of a just, fair, sustainable and inclusive transformation to a green economy. The framework document broadly acknowledges key emerging marginalising risk factors on the basis of: (i) employment displacement caused by economic restructuring, (ii) limited employment mobility and access to skills training resulting from the gendered division of labour, (iii) age related barriers to participating in Guyana's green transition, (iv) geographical proximity to economic services and labour force participation opportunities, (v) access to formal green education and skills training, (vi) equitable wealth distribution and income levels, and (vii) the multiplier effect of inequalities arising from marginalisation related to physiological factors. Guyana's plans to restructure its sugar industry offers an example of how arising labour market concerns are being considered. As of 2017, Guyana's sugar industry employed an estimated 16,000 persons directly.²⁵ A Parliamentary paper on the future of the state-owned Guyana Sugar Corporation (GUYSUCO), reported, "Employment costs [in the sugar industry] accounted for 48 per cent of total costs from 2010 to 2015, thereby absorbing 73 per cent of the revenue earned by GUYSUCO during that period. The dire revenue situation coincided with the loss of preferential markets and prices that the company enjoyed from 1976 to 2009".²⁶ The main elements of restructuring Guyana's sugar industry are premised on expanding and

diversifying the sugar industry to reduce losses, increase operational efficiency and profitability by consolidating a number of existing sugar estates and factories. Workers, as required, will be redeployed to consolidated locations. They can also opt to capitalize on land divestment for crop cultivation, value-added agri- business and related income-generating activities. Workers will also have access to training initiatives implemented by the public sector, private sector, and civil society at large. It will have to be seen if and how it will work out in practice.

Labour force indicators for skills development and the green state agenda

The current labour market response to Guyana's green shift is primarily ad hoc, stimulated by market- driven, labour safety net concerns and educational reform actions to strengthen climate change learning, biodiversity education, STEM and sustainable development content and training across the public-school system, including TVET. Both the NDS and the GSDS Framework speak to the overall goal of education sector investments to improve skills supply (quantitatively and qualitatively) needed to modernize and green Guyana's economy. We reported in section 3 that policy actions addressing labour market implication of Guyana's green shift are guiding the country's planned transition to a sustainable, green economy driven by climate change, economic restructuring and expansion, as well as national and regional sustainable development objectives. In 2017 for example, green engineering was included as a competency subject in the Caribbean Advanced Proficiency Examination (CAPE) administered by the Caribbean Examinations Council (CXC). This follows efforts in Guyana to deepen inclusion of ecosystems and sustainable development content in fields such as civil engineering, architecture and urban planning and development.

The Bureau of Statistics is Guyana's premier data collection agency. Its 2012 census listed Guyana's total labour force at 279, 799 persons. This agency executes inter alia census, Household Income and Expenditure Surveys, Consumer Price Indices, and Multiple

24 Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017. Pg. 9.

25 A Parliamentary paper on the Future of the Sugar Industry notes "Employment costs accounted for 48 per cent of total costs from 2010 to 2015, thereby absorbing 73 per cent of the revenue earned by GUYSUCO during that period. The dire revenue situation coincided with the loss of preferential markets and prices that the company enjoyed from 1976 to 2009." State Paper on the Future of the Sugar Industry. (2017). Pg. 3.

26 State Paper on the Future of the Sugar Industry presented to the National Assembly by Guyana's Minister of Agriculture. (2017) pg. 3.

Skills for Green Jobs in Guyana

Indicator Cluster Surveys. Furthermore, they provide statistical training and collaborate with varying partners to design data collection tools and analyse data.²⁷ Responsibilities for data collection, analyses and application are also spread across other government entities and publicly-funded institutions, e.g. University of Guyana and the Statistical Unit within the Ministry of Social Protection. In June 2017, the Statistical Unit in partnership with the Bureau of Statistics undertook a national Labour Force Survey (LFS) to collect data on skills, wages and educational attainment mainly. The sample covered 200 businesses of varying sectors and sizes, the latter determined by workforce volume; of this sample 176 businesses provided data. Recent prior labour surveys implemented include the: (i) Mining Sector Skills Needs Survey and (ii) Labour Market Intelligence Skills Survey covering the construction, engineering, manufacturing, hotel and hospitality and commercial trade industries.

The LFS findings showed skill shortages were due to: (i) low educational and skills attainment levels, (ii) misalignment between skills required by employers and skillsets, competencies and levels, (iii) higher turnover rate among low-skilled employees, (iv) limited upward mobility for high-skilled workers, (v) inadequate wages and compensation, (vi) limited willingness of employers to invest in continuous on-the-job training or worker professional development due to turnover rates among low-skilled workers and fear of losing high-skilled workers due to emigration or to another employer, (viii) ineffective and inadequate social dialogue and communication mechanisms between the public sector, commercial private sector and civil society and (ix) the prevalence of jobs in the informal sector. The LFS also asked respondents to project their five-year employment demand using six descriptors: (1) managerial professional, (2) technical professionals, (3) technical skills, (4) administrative/clerical, (5) machine operators/drivers and (6) manual/unskilled. Out of the 11 listed occupations in the technical professional category, environmental health officers ranked

8th most demanded. From 12 occupations listed in the technical skills category, Forest Rangers also ranked 8th. Environmental Managers were the 5th most demanded occupation in the Managerial/ Supervisory category; this category listed six occupational types. Other occupational types aligned to priority green sectors listed across all categories include civil engineers, cartographer, electricians, technicians, computer operators and lecturers. Table 4 presents a list of key findings by thematic topics and issues summarized in the LFS.²⁸

Other notable labour market concerns reported speak to high incidences of skills emigration, access to education in rural and rural interior areas, education reform, per capita participation in post-secondary education and youth employability are other key labour force policy concerns.

Commencing in 2018, the Government intends to collect quarterly data for sex, age, thematic sector and industry-focused issues, educational background, occupational status and industry and the location and frequency of employment/unemployment. Information from the LFS will also highlight policy challenges and labour market transformation prerequisites (e.g. additional research on green growth labour policies), vis-à-vis impacts of the country's green shift on its Guyana's labour market.

27 In January 2017, Guyana's Ministry of Finance reported to Parliament that a Poverty Measurement and Analysis Unit will be established in the Bureau of Statistics during the final quarter of 2017.

28 More details can be found between pages 10-11 of the LFS (2017).

Table 4. List of key findings by thematic topics and issues

ISSUE/THEME	SUMMARY FINDINGS
Skills needs	The skills needs of the various firms were identified by the individual sectors and also aggregated as a whole. In each sector, mention was made of the need for technically skilled persons. Respondents stated they will need technically skilled persons in the next two years: mainly, mechanics, machinists, electricians, electrical technicians, computer operators and welders. Additionally, it was noted from the data received, that there will be a need for technical professionals, managerial professionals, machine operations and drivers.
Absence of Tracer Studies	There continued to be the critical need for Tracer studies, whereby the technical institutions could locate the areas where their graduates are currently working. Apart from GUYSUCO Training Centre one cannot definitively identify the occupational locations of the graduates of the post-secondary training institutions and further, if their work is consistent with the occupational areas for which they were trained.
Educational Attainment of the Work Force	In this survey, efforts were made to assess the educational attainment level of the work force; that is the level of schooling of the workers. Twenty-nine per cent (29%) of the respondents attended and completed secondary school, two per cent (2%) graduated from University, less than one per cent (0.4%) post-graduate, while fifty-seven per cent (57.4%) of the respondents did not state their educational attainment, [which was unsatisfactory].
Important Criteria for Recruiting Staff	Establishments recruiting staff have indicated that essential criteria for selection included: knowledge and skills specific to the occupation, responsibility and commitment and prior experience of the job.
Main Difficulties Recruiting Staff	Major difficulties in recruiting staff included applicants' lack of experience, under-qualified applicants, inadequate compensation offered and to a lesser extent, incompatibility of working hours.
Hiring Problems Impacting the Recruitment and Training Policies	It was found that of the one hundred and sixty-nine (169) persons hired, seventy-five (75) were hired and immediately trained. The majority of those hired and immediately trained (53) were personnel with basic levels of skill and (11) were highly skilled persons. In terms of hired and not immediately trained personnel, 94 persons fell into this category, 46 of whom were employed as basic skilled personnel.
Future Plans of the Establishment	Establishments have given a fairly optimistic view of their future endeavours. The majority of the establishments indicated plans for capital/infrastructure expansion, expansion/extension, recruitment, and training/retraining of existing staff. Only two (2) establishments stated that they have plans to retrench staff.
Supply side	The post-secondary training institutions provided information on graduates for the years 2013 to 2015. The data showed that graduation levels were not adequate to meet the demand for such services in several disciplines, and some technical students were from time to time hired by a few firms, even while they are in the final year of studies. On the other hand, in some instances female graduates were not very representative or involved in the several skill disciplines.
Demand side	Establishments were willing to pay substantial remuneration for employing certain skilled persons; an indicator was the high demand for electricians, mechanics and technicians. It was noted that experienced electricians in some sectors were better paid than mechanics. At the managerial level, there was a great demand for operational managers, while in the category of skilled professionals, Financial Accountants received significant compensation which is indicative of the demand for such services.

Green growth and the labour market information system

Green growth requires stringent environmental policy development informed by the impacts of restructuring and greening the economy on labour force requirements and employment. These impacts will vary across sectors and between “brown” and green jobs.

Guyana is ranked in the third tier of the Caribbean LMIS. The Government is reorganising and investing in Guyana’s national data collection architecture, systems and technical skills to improve the reliability, availability and flow of data for policy, programme planning and results-based management. Prior to 2015, Guyana’s LMIS was ineffective and under-utilized. The Statistical Unit manages Guyana’s LMIS and also has responsibility for data management aligned to the Ministry’s broader mandate of social, human and children’s rights and welfare concerns. As referenced previously, quarterly labour force intelligence surveys will become a regular practice, which will help feed a range of thematic and issue-based data to the LMIS. Although data collected by the recent LFS and prior labour force surveys are transversal, neither the Department of Labour, Bureau of Statistics nor the Statistics Unit are collecting data specific to green jobs, goods and/or services.

Streamlining upstream and downstream data management for greening the labour force, i.e. training and (re)training aligned to skills requirements outlined in the GSDS Framework is critical for designing and integrating plans for active labour market policies in the final version of the GSDS, Guyana’s Green Paper. However, ongoing delays to incorporate green skills and broader labour market indicators, design thematic instruments and fully activate the LMIS system put at risk fostering the policy objectives for an inclusive, just and fair green transformation. Moreover, full functionality of Guyana’s LMIS in conjunction with the incorporation of green skills and occupation indicators is aligned to the CARICOM mandate that member countries adopt good LMIS practices that foster effective regional LMIS integration and the free movement of skills.

Thus, improvements in Guyana’s LMIS could facilitate skills transfer and training opportunities for greening its economy.

Performance-based monitoring and evaluation of green growth policy indicators

The National Monitoring and Evaluation Strategy (NMES) and Action Plan objectives are to institutionalize performance information into policy-making and Government decision-making throughout the public sector. Overall, the NMES focuses on improving public service delivery, efficiency and accountability encapsulating budgetary and programmatic performance. The Monitoring and Evaluation Unit – Ministry of Finance and Bureau of Statistics are centrally responsible for overall management and operationalization of Guyana’s performance monitoring and evaluation system. Collectively, their mandates also make provisions for the decentralization of technical skills competencies and guidelines for performance measurement, monitoring, reporting and evaluation throughout the public sector. In 2016, approximately 1,090 government workers including programme leads and support officers, ministers, budget officers and technical officers received training. Improved performance-based monitoring and evaluation systems and competencies are aligned with the GSDS Framework policy objectives of: (i) ensuring evidenced-based economic and labour policies, (ii) robust monitoring, evaluation and reporting on the GSDS and (iii) addressing knowledge management skills requirements, including reducing skills gaps for the application of information communication technology for improved e-governance and secure electronic payment services.

4.2 Education and training

The GSDS Framework recognizes that increased circularity, competitiveness and productivity in a green economy necessitates a knowledge-based, highly skilled and technology-inclined labour force. With respect to Guyana's labour force and economy composition it states, *"the economic structure is low in complexity, consisting largely of intensive use of unskilled labour and small amounts of capital and technology ... it has low comparative advantage in knowledge-intensive products"*.²⁹ Along these lines, Guyana's labour force will be impacted by two distinct and interlinked processes: (i) restructuring the basic configuration of the economy and (ii) greening the economy. These processes connect the principle policy goals of the LCDS, i.e. capitalizing ecosystem services and pursuing a low carbon economy and Guyana's 2030 Vision for a Green, Inclusive and Prosperous Guyana which seeks to deliver, "a good quality of life for all its citizens based on a sound education and social protection, low-carbon resilient development, green and decent jobs, economic opportunities...".³⁰

During the period 2012 to 2013, the Government partnered with the United Nations Educational, Scientific and Cultural Organisation (UNESCO) to implement a CCESD programme. The programme delivered training for academic, policy and planners who were also involved in producing a comprehensive situational analysis of policy, curricula, teacher-training and methodologies for delivering CCESD throughout the school system. The resulting diagnostic and stakeholder preparation informed Guyana's ESD Policy (2015) and the 2014-2018 Strategic Plan of the Ministry of Education.

Guyana's EDS Policy (2015) lays out the country's priorities for access to quality education, human development and green skills. The core objective of the policy seeks to vertically and horizontally

integrate low carbon, green development, CCESD at each level of the public system, and in non-formal and informal education settings.

Inclusive climate change and sustainable development education

Inclusive, locally relevant and globally contextualized sustainable development education for Guyana's green transition is a core objective of the shift to a sustainable green economy. According to the Second Compendium of the 2012 Population and Housing Census, school aged population in Guyana equates to approximately 30 per cent of the general population.³¹ Of this figure, the census reports that 180,405 persons attend school full or part-time or 61.9 per cent of the school-aged population. Disaggregated by sex, school enrolment ratio is fairly evenly distributed between males and females. Rural regions of Guyana experience lower enrolment rates on average than urban locations. As school age increases, however, enrolment in secondary and post-secondary education decreases with the sharpest decline between secondary and post-secondary with only ten per cent of the school-aged population attending a post-secondary learning or training institution. The census reports that, *"almost two-thirds of the adults, 15 years and over interviewed said their highest education reached was secondary education. This situation presents a challenge to policy-makers to facilitate both economic opportunity and education for these advanced school age groups"*.³² According to Frederic et. al. (2008) approximately 90 per cent of University of Guyana graduates aged twenty-five and older emigrate annually to more developed economies seeking adequate employment, higher wages and improved quality of life factors.³³

29 Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017. Pg. 9.

30 Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017. Pg. 6.

31 Guyana school-aged population is approximately 225,000. Guyana Population and Housing Census (2012). Pg. 11.

32 Guyana Population and Housing Census. Pg. 7.

33 Frederic Docquiera, B. Lindsay Lowell and Abdeslam Marfouk. A Gendered Assessment of Highly Skilled Emigration. December 2008.

Skills for Green Jobs in Guyana

Recognizing the varying facets through which education in Guyana is delivered, priority areas of CCESD within Guyana's ESD policy (2015) are framed by sectors, giving relevance to its importance in non-formal and informal education settings. These priority areas are outlined in Table 5.

In addition to a sector focus, inclusive CCESD also means shared and widespread basic knowledge and training. Guyana's ESD policy lays out actions to ensure all stakeholders

have a consistent understanding of CCESD and its applicability in work and family life. It was clear through the primary data collected, there is much confusion and variation in what a green economy, specifically green jobs, are defined as. Furthermore, it was fairly consistent across all interviews that stakeholders felt the Guyanese mindset must evolve as the economy is evolving in a green direction, and the ways to do this are through family messaging and the education sector. The OCC in collaboration with the Caribbean Youth Environment Network,

Table 5. Education Sector Priority Areas Relative to Green Growth

	EDS PRIORITY AREAS	LINK TO U.N. SDG	EDS PRIORITY AREA LEARNING OBJECTIVE	PRIMARY SECTORS INFLUENCED
1	Biodiversity and Biodiversity Management	Goal #15	Promote biodiversity education and develop skills to protect, manage and sustain functions, services and socio-economic benefits.	Environment, Tourism and Forestry
2	Agriculture (Food, Nutrition and Security)	Goal #2	Education and skills for adaptation, mitigation; crop and value-added diversification in agriculture.	Agriculture and Forestry
3	Energy	Goal #7	Energy conversation and management aptitude and practice.	Energy (cross-cutting)
4	Water	Goal #6	Water management understanding, water conservation practices and development of positive water conservation behavioural change.	Water (cross-cutting)
5	Solid Waste Management	Goal #6	Increase awareness of and mitigate effects of improper disposal on environment, health, economy, community and culture.	Health, Environment and Energy (cross-cutting)
6	Environmental Education	Goals #15 and #6	Strengthen citizens' value and application of environmental and ecological knowledge in private and professional spheres.	Environment and Tourism (cross-cutting)
7	Climate Change Education	Goal #13	Create and enhance knowledge, inculcate attitudes and values, develop skills and modify behaviour in support of climate change mitigation and adaptation strategies. ³⁶	All

34 Guyana's Education for Sustainable Development Policy (2015). Pg. 27.

a non-profit regionally-affiliated programme, are collaborating to implement climate change and green awareness in nursery, primary and secondary schools across Guyana aimed at promoting behaviour change. The initiative uses short videos, interactive learning methods, quizzes and incentives to equip students with knowledge and actions towards better water management and environmental preservation among others.

Similarly, the school-based Green Generation Guyana (3G) programme is a national effort that promotes safe and efficient waste disposal awareness, minimization and practices among school- aged youth. It is being implemented in phases commencing with pilot exercises. Components of the programme are: (i) sustainable waste disposal awareness, knowledge, capacity and attitudes, (ii) provision of colour-coded waste separation bins for recycling, composting and waste and (iii) (3G) Camps during which children and youth learn and practice the importance of sustainable waste management.

At the tertiary level, the University of Guyana and the Critchlow Labour College (CLC) are taking steps to better align their programmes and institutions to meet the anticipated skills demand for green growth sectors. Additional information about the University's efforts are included in the case study, Education Sector Reform to Support Guyana's Green Programme: University of Guyana Science and Technology Support Project. The University has implemented campus-wide reform to strengthen the technology, science and researched-driven aspects of all programmes and courses. It has also held two seminars on the challenges and opportunities intersecting Guyana's green programme, economic restructuring and emerging petroleum sector under its Tain and Turkeyen Talks banner. Illustrative of one such programme supporting building a qualified pool of candidates for Guyana's green economy is in the FEES. The faculty offers five undergraduate (Geography, Double majors in Geography and selected disciplines and Environmental Studies) and three postgraduate programmes (MSc. Environmental Management and Postgraduate Diplomas in Urban Planning and Management and Environmental Management). The MSc. in Environmental Management introduced training courses in Community-based Disaster Risk

Management, Disaster Risk Management in the Caribbean and Emergency Planning and Management. Within the past few years, the mandate of FEES has been expanding to include consulting services to meet growing CCESD training requirements, research and technical skills demand.

The CLC is recognized for its historical service to all Guyanese, especially its track record of helping working class Guyanese to gain entry in the country's labour market and professional development training. CLC, in response to Guyana's green transition, began offering certificate programmes in the areas of sustainable agriculture, sustainable forestry, fisheries and aquaculture, sustainable mining and a Master of Science/postgraduate diploma in food security and climate change from September 2017. As part of a series of stakeholder consultations, the CLC consulted select private and public- sector agencies in the aforementioned sectors to inform the design and delivery of CCESD courses by the college. Consultations were carried out to better understand current and emerging labour needs, challenges and opportunities, and how best the college could support corresponding education and skills training. With three learning sites in Guyana's three most populous regions, the CLC offers specialized courses to meet technical demands required of CCESD and other fields. In parallel to the aforementioned illustrated CCESD tertiary levels experiences, Guyana invested approximately US\$ 40 million in education reform actions between 2012 and 2017 – The Guyana Education Sector Improvement Programme, The Secondary Education Improvement Programme and the University of Guyana Science and Technology improvement Project – to upgrade STEM capabilities, deepen CCESD, research and real-world learning and teaching requirements and a number of other actions including curricula, technology, laboratory, and human and institutional capacity development. More details on these programmes are included in the CCESD case study.

At the institutional level, the GSDS Framework prioritizes the five strategic actions³⁵ summarized in Table 6.

35 Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017. Pg. 17.

Table 6. CCESD Priority Institutional Development Actions

	STRATEGIC AREA	STRATEGIC AREA OBJECTIVES
1	Access to quality education and training facilities	New and upgraded teaching institutions - regulate facility standards, laboratory and learning settings – Green Academy – Green Campus – Green Classrooms – local autonomy improvement provision.
2	Availability and quality of teaching and school management personnel	Regular audit of management and teaching capacities and labour pool – education sector human resource plan – integrate and update green, disaster resilient and learning conducive aspects of human resource training.
3	Curriculum, instructional tools and methods	Curricula improvement and reorientation for green, human and human development goals – revise and or introduce instructional guides and learning strategies – focus on research, science and practical learning.
4	On-going education, training and public information programmes	Strategies to disseminate skills-training, certification and assessment beyond formal education – skills development for citizens transitioning from declining sectors to emerging green occupations – diaspora engagement actions to boost human capital and enterprise investment – assessing and forecasting skills, education and labour demand – public awareness and green community initiatives to influence sustainable consumption and appreciation of environment. ³⁸
5	Performance monitoring and accountability system, including parental participation	Redesign and monitor community and parental engagement in education approaches, tools and systems

CCESD in Guyana's TVET system

Guyana's public education system is the country's largest provider of labour market skills training, both specialized and generic. CCESD measures in the public education system are key sources of influence for labour market preparation and skills development strategies in multiple sectors. The work between the GEA, TVET and Ministry of Education is an example of how CCESD actions foster interaction at the policy and programme levels through social dialogue and other planning vehicles. The types of engagements listed below demonstrate the means through which collaborative actions amongst the GEA,³⁷ training institutions, the Ministry of Education and the commercial private sector and civil society are realized:

Training institutions

- ▶ Participate in career fairs by educating the next generation towards a more sustainable-energy future;

- ▶ Advise on training needs for the sector in order to inform the development of training curricula;
- ▶ Conduct Energy awareness activities in schools;
- ▶ Disseminate energy information materials to schools.

Private sector

- ▶ Offer advice on RE and EE;
- ▶ Secure sponsorships for printing of public education materials for dissemination to schools;
- ▶ Hosting of seminars integrating both public and private sector participation such as financing opportunities;
- ▶ Conducting energy audits gathering pertinent data that will form the basis for future project conceptions;
- ▶ Dialogue and engagements with the private sector bodies.

Both Guyana's private sector associations and the Ministry of Education recognize the country's TVET system as a leading provider of technical skills training and labour supply. Guyana is one of seven countries in the Caribbean accredited by the Caribbean Association of National Training Agencies (CANTA), thus allowing them to issue

36 An example of this form of public awareness and engagement is the Green Generation Initiative launched through the Public School system.

37 A listing of other awareness and capacity-building initiatives, at the local, national, regional and international levels in which GEA has been involved or collaborated with can be reviewed in Annex D.

graduates with Caribbean Vocational Qualification certificates. Guyana currently has four training institutions, four training centres, the Carnegie School of Home Economics and the Craft Production and Design Division of the Ministry of Education.³⁸ Non-formal TVET programmes comprise a number of internship, work-study, on-the-job training and professional development programmes typically financed and managed by employers to meet specific occupational needs. In 2017, approximately 400 students graduated from TVET programmes in Guyana. To foster a more conducive enabling environment at the policy level necessary for TVET reform inclusive of CCESD, Guyana established a new TVET policy (2011), a precursor to its TVET Strategic Plan (2013). Together, both are premised on addressing core challenges of greater alignment between TVET training and labour market skills requirements, enhanced public/private sector collaboration on TVET and quality assurance for facilities, curricula, teaching and institutional systems. Guyana subsequently invested US\$ 14 million to implement the Skills Development Employability Project, which commenced in 2017. Inter alia, the project will: (i) integrate renewable energy in all TVET institutions and training centres, (ii) incorporate CCESD in theoretical and practical training for students, instructors and at the institutional level, (iii) improve quality standards of classrooms and training centres and (iv) undertake comprehensive curricula reform. The inclusion of CCESD in TVET is important as it provides another avenue for the inclusive practice of CCESD by producing a citizenry well informed about sustainability. The TVET curriculum must reflect this by encouraging environmental mindfulness, as well as a standard for the production of resilient, sustainable infrastructure and systems with appropriate application of relevant technologies. Both the institution of TVET and Guyana's private sector must become aware of sustainability issues which require specific training programmes to be designed and developed for managers and supervisors.

38 Accredited TVET institutions in Guyana are: (1) Essequibo Technical Institute, (2) Government Technical Institute, (3) Linden Technical Institute, (4) New Amsterdam Technical Institute, (5) Leonora Technical & Vocational Training Centre, (6) Mahaicony Technical & Vocational Training Centre, (7) Guyana Industrial Training Centre, (8) Upper Corentyne Industrial Training Centre, (9) Carnegie School of Home Economics and (10) the Craft Production and Design and Division.

4.3 Active labour market policies (ALMP) and retraining measures

Overview of ALMPS

Guyana's green growth policy framework outlines several labour market implications that greening and structuring its economy will occasion. Section 4.2 listed several CCESD priority sectors, the GSDS Framework also broadly illustrates skills requirements aligned to strategic areas under each of its seven central themes. Sectoral briefing notes in the CRSAP lists a number of strategic planning, human capital, institutional and technology investments to strengthen climate change resiliency and sustainability in fifteen sectors. The above-mentioned national policies have stimulated sectoral, thematic and issue based policies linked to emerging ALMP strategies and initiatives. For some situations like Guyana's plan to consolidate its sugar industry which is projected to threaten livelihood security for thousands resulting from anticipated job losses, ALMPs concerns are widespread, however specific policies have not materialized. Using this example, Guyana's programme response will be necessitated by market concern, vulnerability, demographic and sociocultural concerns since the vast majority of sugar workers are of East Indian lineage, living in rural communities comprising a majority of Guyanese of the same lineage. In addition to the above-noted marginalizing variables, ALMPs in relation to the country's green transition must also be seen in the context of its inclusive CCESD strategy.

Emerging active labour market programme strategies

Prioritizing skills requirements and labour market participation for vulnerable groups

Restructuring and greening Guyana's economy will undoubtedly trigger job losses, employment creation, modified job descriptions and skill requirements, as well as marginalize some workers and job seekers in varying ways. Therefore, marginalizing and vulnerability factors will require more systematized policy attention, not only as a national policy concern, but for industries and

Skills for Green Jobs in Guyana

sectors too. The responsiveness of ALMPs will ultimately depend on evidence-based inputs, multi-stakeholder coordination and partnerships, and their capacity to anticipate disaggregated labour force challenges. As Guyana is now in the preparatory planning stage of its economic restructuring and green transition, it is necessary

to frame emerging strategies to mitigate labour force vulnerabilities by examining intersections between illustrative policy options and objectives and emerging experiences. Table 7 shows labour force participation policy issues relating to specific priority groups highlighted in the GSDS Framework, as well as emerging actions.

Table 7. Facilitating Participation in Guyana's Green Economy by Priority Cohort

YOUTH**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(a) Children and youth (0-24) account for approximately 60% of the population; (b) 424,988;⁴¹ – youth unemployment estimated at 10-12% – (c) 90% of University graduates emigrate annually – (d) significant # of youth enter the labour force upon completing secondary school and therefore require more employable skills right out of school – (e) geographic location of youth affects access to education, skills training and employment – (f) employment opportunities driving rapid urbanisation among youth.

Indicative green skills policy objectives and actions

Advance and apply traditional indigenous knowledge in environmental sustainability, farming inter alia; access to green skills training and basic education, support green employment opportunities e.g. sustainable agriculture, ecotourism and environmental services, land and mining rights, sociocultural well-being and protection, and intellectual rights.

RICE AND SUGAR FARMERS**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(a) Two of the largest sectors of employment, anticipated restructuring and significant job losses due to market, productivity and competitiveness challenges, (b) sugar, rice, fruit and vegetable farming and processing are the largest sources of rural employment, rural poverty rate is 37%, (c) Indo-Guyanese account for much of the labour force, (d) accessing green skills training and (e) job creation and transitioning workforce to new and/or reoriented occupations.

Indicative green skills policy objectives and actions

Climate-smart and resilient farming training, knowledge and technology transfer; entrepreneurial training and start-up support; training aligned with value chain expansion; upgrading manufacturing capacities for greening and support systems for workforce retraining and transition.

FRUIT AND VEGETABLE FARMERS**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(a) Crop cycle disruption and inconsistent yield due to hydrologic variability impacts (b) diversification of range of fruits and vegetables and undertaking of value-added production, (c) accessing and developing markets for new produce e.g. organic and agro-processed goods and (d) ozone depleting and soil contaminating pesticide and fertilizer use.

Indicative green skills policy objectives and actions

Climate smart, resilient and decarbonised agriculture e.g. aquaculture, shade house farming, climate resilient crop varieties, organic and natural pest control and fertilisation, clean energy agro-processing; drainage and irrigation improvements; ecosystem awareness; subsidized raw material and climate-smart farming systems training.

FRUIT AND VEGETABLE FARMERS**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(a) Crop cycle disruption and inconsistent yield due to hydrologic variability impacts (b) diversification of range of fruits and vegetables and undertaking of value-added production, (c) accessing and developing markets for new produce e.g. organic and agro-processed goods and (d) ozone depleting and soil contaminating pesticide and fertilizer use.

Indicative green skills policy objectives and actions

Climate smart, resilient and decarbonised agriculture e.g. aquaculture, shade house farming, climate resilient crop varieties, organic and natural pest control and fertilisation, clean energy agro-processing; drainage and irrigation improvements; ecosystem awareness; subsidized raw material and climate-smart farming systems training.

FRUIT AND VEGETABLE FARMERS POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION

(a) Crop cycle disruption and inconsistent yield due to hydrologic variability impacts (b) diversification of range of fruits and vegetables and undertaking of value-added production, (c) accessing and developing markets for new produce e.g. organic and agro-processed goods and (d) ozone depleting and soil contaminating pesticide and fertilizer use.

Indicative green skills policy objectives and actions

Climate smart, resilient and decarbonised agriculture e.g. aquaculture, shade house farming, climate resilient crop varieties, organic and natural pest control and fertilisation, clean energy agro-processing; drainage and irrigation improvements; ecosystem awareness; subsidized raw material and climate-smart farming systems training.

EXTRACTIVE INDUSTRIES SECTOR (GOLD, DIAMOND AND SAND MINING AND FORESTRY)**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(a) Mitigating carbon emissions considering the importance of sectors' economic contributions, (b) primarily low-skilled labour force, (c) key source of work for Guyanese, (d) environmental degradation and deforestation, (e) sustainability practices, incentives and capacities of enterprises and workers, (f) transitioning workers to new or greened occupations within and outside sectors and (g) over-reliance on raw commodity revenue.

Indicative green skills policy objectives and actions

Better enforcement, monitoring and skills development to improve reclamation, rehabilitation and environmental sustainability regulations; elimination of mercury in gold mining, alleviation of contamination risk factors; improved extraction technology and standards to reduce harmful emissions; enhanced institutional capacity of mining workers, managers and operational systems and facilitation of value-added investments.

ECO-TOURISM OPERATORS AND SERVICE PROVIDERS**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(i) Build local and greater appreciation of Guyana's ecosystems and natural environment, (ii) long-term investments by entrepreneurs, (iii) accessibility of tourism for resident Guyanese and (iv) scaling eco-tourism market.

Indicative green skills policy objectives and actions

Linking conservation to community-based tourism enterprises and aligning ecosystem services to nature and ecotourism (e.g. biodiversity research programme at Iwokarama); long-term viability of business models and markets; greening traditional mass tourism

ENERGY SECTOR TECHNICIANS**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(a) Institutional capacity to manage national renewable and energy coverage expansion, (b) volume and type of skills aligned to renewable options and (c) low emissions technologies training, skills and professional standards.

Indicative green skills policy objectives and actions

Licensure and certification for new skills required, upgrading and training e.g. photovoltaic technicians; institutional technical capacity for renewables conversion, energy expansion and engaging new petroleum industry; multi-disciplinary, transferable skillsets, e.g. energy economists and new energy technology skills.

GEOGRAPHIC VULNERABILITIES**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(a) Community livelihoods disrupted by climate change, greening economy and restricting industries and (b) community livelihoods risk exposure and capacity to incorporate environmental sustainability in current and new livelihood strategies.

Indicative green skills policy objectives and actions

Enterprise training and public awareness to build capacity for greening and diversifying local economies; alternative livelihood training leveraging comparative advantages.

MICRO AND SMALL ENTERPRISES**POLICY ISSUES RELATED TO GREEN ECONOMY PARTICIPATION**

(a) Finance and technical skills barriers, (b) accessing and sustaining markets, (c) scaling up capabilities and joint venture aptitudes.

Indicative green skills policy objectives and actions

Subsidise and reduce barriers to financing, skills training to develop greening expertise, support market access and development capabilities – local and export, encourage peer-to-peer learning and knowledge sharing.

Skills for Green Jobs in Guyana

The policy concerns above are represented in the following examples. These developments are indicative of current experiences and strategies that are likely to be more structured and nuanced as Guyana finalizes and implements its planned greening and economic restructuring actions.

Investing in green skills and employment for Guyana's indigenous peoples

Guyana's hinterland is home to the vast majority of its Indigenous population (Regions 1, 7, 8 and 9), who comprise approximately ten per cent of Guyana's overall population. Factors contributing to higher than national average measurements of poverty and inequality in these regions are: limited opportunities for income-generating livelihoods; sparse location and dispersed communities; lack of historical cultural livelihood strategies; limited access to basic services such as education and health; and costly and limited transport infrastructure options. With that said, ample opportunity exists to invest in green economic development initiatives and skills development for the hinterland. These being in the areas of sand enterprises and ecotourism. Such investment will reduce community dependence on unsustainable logging and mining activities, provide viable employment options and preserve the rich biodiversity and cultural heritage of the region.

The Leveraging Capital in Guyana's Rupununi Project is a multi-sector partnership between Conservation International (CI) and IADB's Multi-Lateral Investment Fund, who collectively financed US\$ 1.2 million towards the project. Moreover, the Government waived taxes on income from a seed investment of US\$ 300,000 by the Guyana Bank for Trade and Industry (GBTI) in the Rupununi Innovation Fund. This Fund provides access to low-cost start-up financing for indigenous communities to develop climate resilient and environmentally sustainable enterprises in agriculture, eco and nature tourism, and fishing in particular. Additionally, beneficiaries receive entrepreneurial training, access to market support, awareness and capacity-building for ecological systems maintenance and are involved in forest conservation mandates undertaken by CI. CI notes that twenty-three indigenous community-

based enterprises, impacting 42 per cent of the population of Region 9 in Guyana will be directly impacted. Another inclusion strategy to support participation of indigenous groups in a sustainable green economy is the "Opt-In" in GRIF⁴⁰ facility. Communities that Opt-In receive a share of total REDD+ payments received by Guyana. In exchange, these communities receive training to monitor, verify and report on agreed forest conservation targets. Communities through their respective governance structures collaborate to apply finances received for community development actions, including green enterprises. Indigenous communities have titles to upwards of 14 per cent of land in Guyana.⁴¹

Similarly, the Amerindian Development Fund (ADP), financed through the GRIF facility was established to provide access to financing for economic, social and environmental development activities in indigenous communities. Approximately 180 communities located in Guyana's rural interior are eligible to access the fund to finance activities included in their respective community development plans. In addition to community and enterprise development financing, the ADP facilitates training in business development, climate resilient agriculture, apiculture, forestry, low carbon livestock farming and other skills. Once Community Development Plans are approved via majority or consensus vote during an official community general meeting, the Government and communities enter into a Micro Capital Grant Agreement. The fund anticipates that at least 180 Micro Capital Grant Agreements will be signed by the final quarter of 2017.

Guyana's low carbon, green micro and small enterprises programme to secure vulnerable livelihoods

Micro and small enterprises in Guyana typically employ five or fewer workers.⁴² The primary

40 In Section VI – Conclusions and Recommendations, we demonstrate how the GRIF is financing active labour market initiatives for Guyana's Indigenous peoples and its scaling potential to mobilize resources required to finance ALMPs addressing of labour market challenges for priority groups.

41 Government of Guyana. Low Carbon Development Strategy. (2013) Pg. 9.

42 The Compete Caribbean Private Sector Assessment

barriers to growth experienced by these businesses include access to competitive financing rates, technical skills training and business technology integration. These challenges will impact the sectors' effort to adopt environmentally sustainable practices and improve efficiency. They also represent key policy concerns for the Government and private sector. The characteristics of micro, small and some medium-sized enterprises in other sectors, including forestry and agriculture, exhibit similar characteristics. They are typically labour-intensive and sparsely technology-intensive. Aggregately, micro and small enterprises (MSE) are a significant employment and livelihood pillar contributing to economic productivity and capabilities to meet household consumption needs. Small and medium enterprises (SMEs) accounted for an estimated 30 per cent of Guyana's GDP in 2009, with approximately 22,000 active firms across multiple sectors.⁴³ To provide a useful comparison of employment numbers among SMEs, the study, "Towards the Greening of the Gold Mining Sector of Guyana" produced by the Inter-American Development Bank, reported that 90 per cent of an estimated 17,363 persons employed in the mining sector are employed in small and medium-scale operations.

In response, partnerships among the public sector, civil society, commercial private sector, including commercial financial institutions and business management training entities, are facilitating skills development and low-cost financing to encourage decarbonized, green job growth among SMEs. An example of this is the Rupununi Innovation Fund managed by CI. The Fund aims to strengthen green enterprise and investment capacities of indigenous communities in Guyana's Rupununi district; agriculture, agro-processing, nature-tourism and eco-tourism are priority enterprise development opportunities. The GBTI holds and disburses low-interest financing for entrepreneurs through the Rupununi Innovation Fund. To

facilitate lower interest rates, the Government issued an income tax exemption for revenue earned by the bank from the fund. In addition to this, the GBTI has established a Green Loans programme that provides investments for: (1) solar energy products, (2) water treatment recycling – water filters, (3) energy-saving appliances, (4) air filters, (5) wind power projects, (6) hand powered projects, (7) and low carbon economic investments including high-end fruits, vegetables, aquaculture and other low-carbon enterprises. Some of the benefits of the green loan programme are 25 per cent discount on lending services, no late payment fees and zero prepayment penalties.⁴⁴

Another example is Guyana's Small Enterprise Development and Building Alternative Livelihoods Programme implemented by the Small Business Bureau – Ministry of Business which is Guyana's most comprehensive MSE investment programme in terms of its national reach, investment and participating financial institutions. The project's core objective is to foster inclusion of SMEs and vulnerable groups in Guyana's green transition. As at June 30, 2017 the SBB recorded that a total of 125 loans dispersed across 12 industries provided employment security for a total of 580 persons.⁴⁵

Inclusionary approaches to climate smart practices and agricultural diversification

According to the Ministry of Agriculture statistics, the agriculture sector in Guyana contributes approximately 20 per cent to the country's GDP and is responsible for over 33 per cent direct employment.⁴⁶ The sector faces considerable risk of volatility resulting from more intense natural hazard risks with increasing climatic variation weather impacts. With agriculture

Report for Guyana reported that 73 per cent of businesses registered with the Small Business Bureau employ fewer than 5 people, 22.3 per cent employ five to fifteen people and 4.7 per cent employ more than 15 people. Caribbean Development Bank. Guyana Private Sector Assessment Report. 2014. Pg. 10.

43 Updated information on SMEs contribution to GDP and total active SMEs is required.

44 More information on the green loan programme by the Guyana Bank for Trade and Industry can be found at: <https://www.gbtibank.com/products-services/financings/commercial-loans>.

45 The case study, Micro and Small Enterprise (MSE) Development and Building Alternative Livelihoods for Vulnerable Groups (Section 5), provides more details for Guyana's MSE Development and Alternative Livelihood Development Programme.

46 Ministry of Agriculture (2013). A National Strategy for Agriculture in Guyana, 2013-2020: Agriculture - Our Vehicle for sustained Economic and Social Prosperity: Vision 2020. Guyana. Ministry of Agriculture.

Skills for Green Jobs in Guyana

being a major livelihood strategy, recent external market shocks experienced by rice and sugars farmers especially combined with greater frequency and intensity of climatic conditions (droughts, flooding and unseasonal rainfall) experienced by farmers pose serious threats to the country's socio-economic stability and development. In January 2005, Guyana experienced a devastating flood which cost the country in excess of an estimated US\$ 465 million in flood-related damage, equivalent to 60 per cent of the country's GDP. While this disaster was concentrated in Regions 4, 5 and 6 primarily, subsequent flooding and droughts, particularly in Guyana's hinterland, resulting in less severe socio-economic consequences have been recorded.⁴⁷

The GSDS Framework recognizes three important features of Guyana's agricultural sector, first it is the basis for food security and nutrition, secondly it employs thousands of Guyanese and thirdly it is a significant contributor to GDP. Adaptation and mitigation skills training in the agriculture sector reflect horizontal and vertical actions premised on expanding, diversifying and increasing resiliency of the sector for greater food security and competitiveness. The Shadehouse Production and Marketing Project helped construct 41 crop shade-houses and rehabilitate seven others; a total of 320 persons were trained in hydroponic vegetable production.⁴⁸ In partnership with a rural grassroots organization, St. Francis Community Developers, ten green/shade-houses were built and the NAREIA provided training for beneficiary farmers. The Shadehouse Vegetable Production Project (2014-2018) represents a further multi-partner programme coordinated by the NAREI. The programme, a partnership between local farmers, the Government, Partners of the Americas and the IADB/Japanese Trust Fund – the fund invested US\$ 1.3million⁴⁹ –

supports organizing hydroponic⁵⁰ and organic vegetable farmers into geographic clusters.⁵¹ The project's overall objective is to strengthen agricultural livelihood strategies for subsistence and small-scale farmers, with priority given to Guyana's most vulnerable populations.⁵²

At the institutional level, NAREI's Technical and Extension Officers are being trained to align climate resilient practices and policies with agricultural, technical extension and social organisation services to rural micro-entrepreneurs.⁵³ To this end, a climate-smart agriculture manual was developed by NAREI with support from the Inter-American Institute for Cooperation on Agriculture (IICA). The manual provides guidance and instructional practices which are used by NAREIA to train farmers. Furthermore, the Agricultural Disaster Risk Management Strategy and Action Plan⁵⁴ was conceptualized to action more granular actions to mitigate hydrologic impacts and adapt climate- resilient farming practices. The plan brings together Guyana's local government system, the NAREI's Technical and Extension Officers and farmers using an iterative collaboration approach to integrate risk reduction in agricultural planning, cultivation and processing. Localized risk management plans feature region/location specific vulnerabilities, farming systems, mitigation

47 ECLAC: Guyana Macro-Socio Economic Assessment of the Damage and Losses Caused by the January-February 2005 Flooding. Pg. 26. 2005.

48 Success Stories - Hydroponics Vegetable Production in Guyana. <http://argus.iica.ac.cr/Eng/regiones/caribe/guyana/IICA%20Office%20Documents/Success%20Stories%20-%20Hydroponics.pdf>.

49 www.partners.net/country/guyana.

50 In Guyana, the use of the recycling method of hydroponics is utilized. This method referred to as a Nutrient Film Technique or NFT is implemented at NAREI. This is just one type of hydroponic gardening. This method involves the continuous flow of nutrient solutions through a system which is powered by a submerged pump. It is housed in a 50ft by 24ft wooden structure, with concrete filled base. A shade net is placed around the structure to deter the presence of insect pests. <http://agriculture.gov.gy/2016/11/21/narei-pushing-hydroponics-farming/>.

51 <https://guyanachronicle.com/2014/03/17/shadehouse-project-launched>

52 Ministry of Agriculture (2013). A National Strategy for Agriculture in Guyana, 2013-2020: Agriculture - Our Vehicle for sustained Economic and Social Prosperity: Vision 2020. Guyana. Ministry of Agriculture.

53 The International Fund for Agricultural Development reported that 20,800 people, half of them women benefitted from the Rural Enterprises and Agricultural Development programme in Guyana. More information can be found at: https://operations.ifad.org/web/ifad/operations/country/project/tags/guyana/1415/project_overview.

54 The Agricultural Sector Disaster Risk Management Strategy and Action Plan is a collaboration between the Government and the United Nations Development Programme. (UNDP).

processes and structures, as well as adaptation techniques. Farmers and local officials receive training, follow-up support and periodically pilot responses to disaster scenarios. Risk reduction and management are being further integrated into the sectors' regulatory framework. In the medium to long long-term, commercial farmers will be expected to comply with established practices to mitigate crop and income loss for themselves and other farmers.

Youth participation in the green economy

Established in 2016 by the Department of Youth within the Ministry of Education, the Youth Innovation Project is a national initiative to strengthen youth participation in sustainable development and the emerging green economy. The project facilitates access to financial capital for proposals that address a community, regional and/or national development challenge while contributing to a green economy. Ideas and proposals are eligible for support in the following ten areas: (i) science, (ii) technology, (iii) engineering, (iv) agriculture, (v) anthropology, (vi) archaeology, (vii) the arts, (viii) architecture, (ix) mathematics and (x) spirituality. According to the Government's 2017 budget presentation, increased investments were earmarked to improve youth livelihood security through programmes addressing technical and vocational skills, youth entrepreneurial training, community development, employability and access to education for out-of-school and other high-risk youth cohorts. Programmes supported included the Youth Innovation Fund,⁵⁵ Hinterland Employment and Youth Service,⁵⁶ Sustainable Livelihoods and Entrepreneurial Development⁵⁷ and the Youth Entrepreneurial Skills Training. Incorporating green policy objectives with youth development strategies can simultaneously accelerate skills and enterprise development for green growth and increase youth participation in developing the policy framework and sectors for a green economy.

55 A total of US\$ 250,000 was earmarked for the 2017 Youth Innovation Fund in 2017.

56 In 2016, a total of 1,976 indigenous youth participated in training ranging from information technology, auto mechanics, craft, electrical engineering, joinery and masonry.

57 The Government's 2017 budget presentation includes an investment of US\$ 500,000 in the Sustainable Livelihoods and Entrepreneurial Development programme.

Anticipating skills needs and green jobs for Bartica, Guyana's pilot green town

Connecting skills development to planned green investments is a prerequisite for ensuring the local labour force adequately fulfil the requirements for sustainable development and greening the economy. The Green Bartica Development Plan is Guyana's pilot green municipal plan. The Community of Bartica, locally referred to as Guyana's "Gateway to the interior",⁵⁸ has been earmarked by the Government as a pilot town for green initiatives including solar powered street lights with LED bulbs, a renewable energy power supply mix (solar, wind, hydro, biomass, hybrid and wind) provided by an independent provider, greened solid waste management that will feature a modern sewer and wastewater treatment system and decarbonized, ecosystems integrated agricultural production and agri-businesses.⁵⁹ The skills requirements occasioned by this plan cannot be overstated, in particular skilled labour.

Bartica is a small community measuring 68 square miles with approximately 15,000 residents, many of whom work in the mining and services sectors. There are no labour plans or policies interlinked with the Green Bartica Development Plan (GBDP), indicative skills requirements however can be interpreted from the town's planned economic roadmap. The GBDP strategically divides Bartica into North and South Bartica. Priority economic activities proposed for North Bartica include the establishment of a tourist zone and river boardwalk, recreational and open green public spaces, a light industrial zone, cattle rearing, a business and commercial zone, residential communities and a modern sewer and wastewater treatment system. South Bartica will feature agricultural cultivation and agro-processing zones, cultivation and processing of cattle, fish and swine, residential communities, two new landfill sites and an aerodrome for domestic flights. These actions require numerous

58 Interior refers to heavily forested, gold mining locations away from coastal regions of Guyana.

59 The Green Bartica Programme case study provides useful information on the town's green development plans and actions.

Skills for Green Jobs in Guyana

services and skills requirements, some of which are energy audits, climate smart farming methodologies and practices, energy system installation and maintenance services, large-scale construction and engineering projects and sustainable solid waste management. Furthermore, the CRG must create an enabling environment that facilitates adequate employment, labour force education, training and professional development and large investments that accompany skills as well as technology transfer and development.

Decentralizing Guyana's green shift and developing skills for a green state in the local governance system

The core objective of Guyana's Ministry of Communities is to build cohesive and sustainable communities incorporating the vision, goal, objectives and strategic areas of Guyana's green state development thrust, guided by the principles of social equity, economic growth and environmental sustainability. Skills training collaboration is a critical dimension of the Ministry's institutional strengthening programme. Regarding local government skills requirements for greening Guyana's administrative regions, municipalities and local administrative bodies, the Ministry notes that its primary responsibility is to put at the disposal of local government institutions, empirical and performance-based management skills required for active citizen participation and responsibility in the transition to a green state. Training for the preparation of regional and municipal development plans linked to a green state and economy using the village economy concept includes topics related to achieving the sustainable development goals, strategies for greening micro and small enterprises, green job creation and economic growth inter alia. Six of Guyana's eight municipalities have submitted development plans that include greening investments; the Ministry anticipates similar plans for other municipalities.

The Ministry's portfolio responsibilities linked to the GSDS are local government, inclusive and green urban settlements, settlement and residential water management, regional

development and solid waste management. Within this framework, the Ministry partnered with Counterpart International from 2016 to 2017 to provide social cohesion training for residents and local government officials. Following this, the Institutional Capacity-Building Programme implemented by the Ministry and the Caribbean Local Economic Development Programme (CARILED) supported technical skills training for nine municipalities and Ministry officials. Subject matters included strategic planning, good practices in local government planning, community participation and inter-governmental relationships and partnerships. In addition to this, several municipal help-desks, as well as a handbook on strategies for effective discharge of municipal and local government services, were established. The Ministry anticipates expanding its technical staff complement and continuous professional development training for engineers across its subject departments to remain apace with new technologies and practices required for short and long-term actions related to improving wastewater management, extending potable water distribution and maintenance and implementation of a new groundwater monitoring network. Similarly, its new Solid Waste Management Plan (2017-2030)⁶⁰ calls for a local training and certification mechanism to support institutional capacity and programme implementation skills development aligned to sustainable and low-emission waste management and recovery.

Clean, renewable energy: a catalyst for sustainable development and green skills in Guyana

Transforming the power sector to 100 per cent renewable energy sources represents the most important factor for green growth and job creation in Guyana.⁶¹ First, the range, scope and depth of services, products and technologies involved expand the current supply and value chain due to increased spending, investments, service and human capital requirements. One of

60 Integrated Solid Waste Management Plan. Ministry of Communities. (2017). Pg. 15.

61 Guyana's GSDS Framework notes that investments in clean energy can kick-start transition to a Green Economy. Pg. 39.

Guyana's unconditional nationally determined contributions to the United Nations Climate Change Convention Framework is to transfer the energy source of the country's municipalities to renewable sources. To accommodate the planned energy expansion and conversion, labour supply must be multi-skilled, available and inclined. Secondly, ensuring energy security and quality for business growth is the third strategic area of the GSDS policy objective on Energy – Transition towards Renewable Energy and Greater Energy Independence.⁶² Finally, energy cost, access and technology must be affordable across the length and breadth of Guyana.

The Government has undertaken several measures in pursuit of the above goals. The sector policy has been updated accordingly, a new five-year (2016) strategic plan to operationalize its policy objectives is in place and several feasibility exercises and investment plans to develop varying sizes of hydro, wind, photovoltaic, biomass and other fuel sources have been developed or are in the pipeline – e.g. *(Guyana's first solar farm will be constructed in Region 1 – Mabaruma, an indigenous community located in the hinterland. A proposal to rehabilitate the Moco Moco hydropower plan is being completed. Moco Moco is located in Region 9 and is another indigenous village, and the financial and technical feasibility of Amailia hydropower plant is being re-examined)*. Moreover, the Guyana Revenue Authority has undertaken a variety of tax measures aimed at reducing the deadweight burden associated with taxing green infrastructure investments, to make them more financially viable and accessible for local and international investors. Incentives include: (i) tax exemptions for the importation of renewable energy equipment, appliances, (ii) exemptions and one-off corporation tax holidays for construction of water treatment and recycling facilities, (iii) waste disposal and plastic recycling facilities and (iv) exemptions of customs duties and taxes on low-carbon machinery and equipment for use in the agricultural and transportation sectors.

Information and communications technology skills for a sustainable green economy

Strategic area 4.6.2 – Knowledge Management, Information and Communications states inter alia, *“Knowledge management with adequate availability and communication of information on the green economy development transition is a critical part of the GSDS to ensure long-term equitable societal outcomes...”*. The World Bank estimates internet usage per 100 persons at 40/100 for Guyana. Although this ratio is considered basic, it is inadequate to facilitate and sustain Guyana's green economy, which is premised on a decarbonized, knowledge-based and technology-intensive growth. To increase usage and accessibility, especially for vulnerable populations, the Government intends to amend the telecommunications sector bill to allow for more competition. Furthermore, through the One Laptop per Family and One Laptop per Teacher programmes, low-income earning households received portable computers, as well as ICT training. Added to this, the SMART Guyana programme is working to expand e-services and full connectivity for hinterland communities which are amongst the least economically developed and most isolated communities in Guyana. Finally, under the Smart Guyana programme, the National Data Management Authority is spearheading integration of information systems and e-services throughout the Government, including Guyana's public education system. This integration will enable e-government services, e-libraries and e-learning among other services.

4.4 The role of the private sector in skills training

Private sector drivers of sustainability and green skillsets

The private sector plays an important role in job creation and economic growth in Guyana. The scale of local and foreign private sector investment is typically aligned to global commodity prices for Guyana's main productive

⁶² Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017, pg. 23

Skills for Green Jobs in Guyana

and export earning sectors, noted in section 2. In the past ten years, 70 per cent of Guyana's trade volume resulted from trade with five markets, namely Canada, the United States of America, the CARICOM Market, Venezuela and the United Kingdom. Guyana is ranked 121 out of 140 world economies on the Global Competitiveness Index, with an average score of 3.6 per cent out of seven per cent across its twelve units of measurement. The third lowest ranked sub-indices were market size, macroeconomic environment, and health and primary education, with labour market efficiency being the fourth lowest.

Further, the IADB commissioned Private Sector Assessment report notes, "The mechanism by which wealth is generated in these sectors and is transmitted to the rest of the economy may be summarized as follows: adequate incentives for mining and agriculture result in increased investment, which leads to higher levels of production and exports; investment in these sectors has a multiplier effect beyond agriculture, which is amplified by earnings from exports that are spent or invested in the country."⁶³

The pace of greening Guyana's economy and improving circularity is thus heavily influenced by private sector investment and innovation, both key requirements for stimulating employment, technology adaptation and skills demand across sectors. In 2017, the SBB reported approximately 7,000 registered businesses being micro, small or medium size enterprises. As noted in section 2, mid-term economic output levels are expected to remain moderate, but experience a sharp incline primarily resulting from investments in Guyana's emerging petroleum sector. It is anticipated that job growth in the period will trend similarly. The environmental, economic and social returns on current human resource investments for greening Guyana's economy will therefore aggregate over the long-run when it is more likely to experience increases in and current dividends of investments in green technologies, innovations and circular business activities and models by the private sector.

Guyana's Education for Sustainable Development Policy (2015) reports that a mitigating challenge of its green transition is the limited horizontal and vertical integration of climate change education for sustainable development within public and private sector agencies.⁶⁴ The policy further summarizes that the private sector's role in climate change education and sustainable development requires institutionalisation and reorientation. Key policy objectives to this end seek to deepen private sector participation in accessing and influencing skills for Guyana's green economy programme.

Emerging private sector social dialogue and green skills development strategies

Influencing technical skills competencies in the education sector

Guyana is yet in the foundational phase of greening its economy, highlighting the economic incentives and effects of greening the economy on the private sector is nascent. Thus, whilst an emerging policy framework for greening the labour market is pillared on: (i) vulnerability mitigation, (ii) nation-wide CCESD and broader education reform and (iii) market-driven skills, in the absence of such, there is limited yet emerging coordination on corresponding policies and programmes. Guyana's GSDS Framework states that public-private partnerships are a promising green growth vehicle and requires collaborative attention.⁶⁵ Investments in emerging green sectors and practices facilitate employment opportunities, innovation and skills development for Guyana's green economy thrust. The Private Sector Commission (PSC), Upper Corentyne Chamber of Commerce, and industry groups have historically partnered with public education institutions to influence curricula content and delivery, as well as to provide internships and work-study engagements.

63 Guyana Private Sector Assessment Report. Inter-American Development Bank. (2014). Pg. 9.

64 Guyana Education for Sustainable Development Policy (2015). Pg. 5.

65 A particularly promising option may be the establishment of public-private partnerships in which the Government of Guyana works directly with private companies on investments which support activities under the GSDS such as sustainable agriculture, resilient infrastructure and renewable energy.

There are existing business community and public-sector partnerships in the agriculture, mining, manufacturing and forestry sectors, among others. Since the discovery of significant quantities of oil in Guyana's river triangle area, numerous local and international service providers and petroleum extraction investors are collaborating with the Board of Industrial Training and University of Guyana to introduce sector related courses and programmes to meet skills requirement needs.

Guyana boasts a handful of private sector, industry-aligned training and professional development schools; the Demerara Distillers Limited Training Centre, Institute of Private Enterprise Development (IPED) Training Programme and Qualfon Campus and Call Centre are three examples of industry-specific, company owned and operated training institutions. The Government operates training schools aligned to two of Guyana's most productive sectors, mining and agriculture; forestry training programmes are included in the latter. The work of the CLC in this regard was noted prior in section 4.2.

Partnering with The Energy and Resource Institute

The PSC in an effort to better understand and apply strategies to meet the greening needs of local businesses, including skills requirement strategies, signed a Memorandum of Understanding (MoU) with The Energy and Resource Institute (TERI) in 2017. TERI is an Indian-based company specializing in energy efficiency and technology innovation in manufacturing and other sectors. This partnership prioritizes: (i) linkages with private sector enterprises in India, (ii) performance and energy audits, (iii) low-carbon technology transfer, (iv) environmentally sustainable and green business practices, (v) human resource needs assessments and strategies, (vi) energy and performance audits and (vii) feasibility studies for renewables conversion. The TERI programme also encourages social dialogue on local and international greening best practices relating to technology, business modelling and greening the manufacturing industry.

The GSDS Framework prioritizes broad, multi-stakeholder interaction around greening Guyana's economy. The TERI partnership will serve as a useful impetus for Guyana's Green Business Forum inaugurated in July 2017; the forum is coordinated by the Department of Environment. It seeks to advance a resource-efficient, green and competitive private sector by fostering collaborative platforms to capture and disseminate lessons and share technology, information, knowledge and facilitate joint greening ventures.

Interlinking skills training with green financing

At the national level, the Ministry of Business and the Guyana Office for Investment (GoInvest) collectively encourage local and international investments in Guyana. Multi-year strategic plans for both organisations prioritize green, sustainable development horizontally as an investment outcome, as opposed to an investment input tied to national priorities. Parameters and policy considerations for green, sustainable development investment programmes and plans are conceptual and may well evolve as niche investment opportunities. Locally at least two commercial financial institutions and IPED, a microfinance organisation, offer green financing either as parties to a public-private arrangement and/ or independently. Through the Micro and Small Enterprise Development programme, beneficiaries can access competitive financing for green business. Skills training is a shared feature of these green financing arrangements. The latter programme offers skills training coupons that beneficiaries trade in for a variety of business development and management trainings offered by pre-approved training organisations and/ or experts. In section 4.1 we reported on GBTI's work with the Government and CI, as well as their independent green financing options.

Guyana's GSDS Framework lists numerous illustrative financing opportunities accessible to the Government which can be leveraged to invest in public private partnerships linking structural greening actions to labour marketing responses, policy and/or programmatic. Through Guyana's Green Climate Financing Readiness programme,

Skills for Green Jobs in Guyana

Guyana, specifically its National Designated Authority i.e. the Ministry of the Presidency, and national stakeholders, are collaborating to develop a Country Strategic Framework for engaging the Green Climate Fund (GCF). The Framework supports national and private sector institutional coordination and capacities for aligning national green priorities with collaborative or sector specific funding programmes. The GCF has also established a private sector facility for direct engagement with the private sector, subject to the non-objection of the Ministry of the Presidency.

Sector experiences anticipating and fulfilling green skills needs

Forest Law Enforcement Governance and Trade

The European Union – Forest Law Enforcement, Governance and Trade Action Plan (EU-FLEGT, 2003) promotes sustainable forestry management and reduction of illegal logging practices through improved governance systems and voluntary certification compliance for lumber and timber trade with the EU. The EU, one of Guyana's top five export destinations, in collaboration with the FAO, Guyana Forestry Commission (GFC), Forestry Training Centre Incorporated (FTCI) and six small loggers associations in Guyana, designed and implemented a programme to train loggers in sustainable forestry management, improve monitoring protocols and data flows with the GFC; the project also supplied monitoring technologies. As a result, a new forest harvesting model supported the completion of a Legality Assurance System. The programme worked to (i) improve livelihood security of small loggers and (ii) increase natural resource use efficiency, through multi-sector collaboration (Government, private sector, and international partners) and providing forest sustainability management training.

Energy

Sustainability skill sets anticipated for medium and long-term greening opportunities and requirements are now coming into focus for the energy sector. Data on green goods, services and skills have not been gathered by the private sector or Government. The current LFS survey,

as reported in section 4.1, pertains to wages, skill needs and educational attainment. In response to the Government's greening policies and actions, a small number of investments are influencing the demand and supply of sustainability skills, green jobs and green goods. Four leading corporations – Demerara Bank, Nand Persaud International Communications, Eureka Medical Laboratory and Qualfon Guyana – each have invested in renewable (i.e. solar) energy and energy efficiency technology and building design. Qualfon, Guyana's leading BPO service, established its new call centre and campus facility which features a wastewater treatment system; this new facility employs over 4,000 Guyanese. The switch to solar energy by Eureka Medical Laboratory inspired the company to establish a new venture – Caribbean Sun and Wind – to accelerate private sector and residential uptake of low-cost renewable energy and energy efficiency technologies. Demerara Bank incorporated energy efficiency designs in the architecture of its headquarters which is solar powered. The company is negotiating with TESLA to construct two more energy efficient buildings featuring solar roofs, firsts for Guyana. These investments are driving energy innovation in the public sector which in turn has created current and long-term employment and skill needs. The planned Low Mainstreaming Low Emissions Technologies for Guyana's Green Economy Programme will further increase technical skill requirements, employment growth and labour demand for renewable energy jobs.

Eco and nature tourism

Section 4.3 highlighted the way in which stakeholders such as CI, GBTI, the Government and IADB influence skill requirements and training by connecting *environmental awareness and sustainability – enterprise training – access to low-cost finance-market access and development* in response to employment needs, socio-cultural vulnerabilities and green growth opportunities, for hinterland communities in particular. Aggregately, policy-level actions to local and foreign investment, and emerging models of nature tourism, constitute major market drivers of skills demand in this sector. Examples include emerging eco and nature tourism services such as Iwokarama,

Surama Eco Lodge and Arrow Point Nature Resort, which all work to connect conservation, ecological or coastal zone management, and enterprise development, with a community-based approach.⁶⁶

Untapped opportunities exist in Guyana's traditional tourism industry (i.e. hotels, guest houses, bed and breakfast services etc.) to incorporate Leadership in Energy and Environmental Design (LEED) certification, green spaces and climate change design and green architectural concepts.

Institutional support to small farmers and agro-processors - Agriculture

Homenauth (2015) reports that Guyana is currently experiencing initial conditions associated with the following hydrologic changes projected to significantly impact agricultural productivity and practices in Guyana:

- a) Temperature rise: 1.2°C – 4.2°C rise by the end of the 21st century;
- b) Sea level rise: 0.40m – 0.61m by the end of the 21st century; and
- c) Weather conditions: More intense rainfall periods and longer dry periods (Overall drier periods are expected).⁶⁷

Key tenets of an emerging skills response relating to adaptation and restructuring efforts in the sector comprise: (i) adapting to more intense and variable hydrologic conditions by incorporating climate-resilient farming techniques and seed varieties, land reclamation, mechanisation, and fortifying agricultural land management and infrastructure; (ii) modernising manufacturing to boost value-added production, (iii) testing and growing non-traditional crops and (iv) agri-business growth. Guyana's National Agriculture Strategy, National Adaptation Strategy to address Climate Change in the Agriculture Sector and Disaster Risk Management Plan for the Agricultural Sector are key policy enablers for transitioning the sector,

its human capital needs and influencing labour force preparation and (re)training.

The PSC, a number of farmers' associations, NAREI, and the Institute for Cooperation on Agriculture in Guyana have enacted a series of public-private webinars and workshops to raise awareness of climate change impacts on the sector, support transfer of adaption skills and technologies and identify financing opportunities. One such opportunity realised was the Rural Enterprise Agricultural Development Project (READ) which supported 5,200 small farmers to adopt climate resilience farming techniques, plant non-traditional crops and leverage market opportunities. The International Fund for Agricultural Development evaluation of the project reported that on average, farmers recorded increased profits in the six years after they learned to adopt climate resilient practices. This is an important lesson learned that correlates well with the projected demand and training at scale influenced by policy actions and programmes facilitated by public and private sector collaboration on increasing adaptation capabilities for the sector.

4.5 The role of institutional set-up

Section 2 reported the ongoing GSDS consultation and development process, noting inter alia that the next scheduled deliverable is a draft white paper for Parliamentary review after which, the final document – a green paper – will be tabled in Parliament. Once passed, the green paper will be recognized as Guyana's Green State Development Strategy.

Guyana's green transformation mandates are led by: (i) Ministry of the Presidency – Department of the Environment, Office for Climate Change and Project Management Office; (ii) Ministry of Natural Resources, (iii) the Guyana Forestry Commission, (iv) GSDS Inter-Ministerial Committee and (v) Green Multi-Stakeholder Steering Committee. In relation to Guyana's green transition, the responsibilities of the aforementioned stakeholders are presented in Table 8.

66 Guyana's Mangrove Restoration Project produced a community-based tourism service using this model. More information can be found in the Mangrove Restoration Case study.

67 Guyana Climate Smart Agricultural Manual. (2015). Pg. 5.

Table 8. Institutional Governance and Role in Green Transition

STAKEHOLDER	ROLES AND RESPONSIBILITIES
Department of the Environment	The Department of the Environment was established in 2016 to lead, coordinate and manage Guyana's green programme and environmental management activities. Guyana's National Parks Commission, Protected Areas Commission, Wildlife Division and Environmental Protection Agency are consolidated into the department's structure.
Office of Climate Change	The OCC was established to support work on climate change adaptation and mitigation, including climate fund mobilization. The office leads climate change coordination efforts of government agencies and other stakeholders.
Project Management Office	The Project Management Office has oversight and management responsibility for GRIF projects. The office also supports project coordination and development of other green sector projects and provides green and low-carbon policy inputs.
Ministry of Natural Resources	The MNR has policy and management responsibility for natural resources and petroleum management. It coordinates and oversees the work of implementing agencies such as the Geology and Mines Commission, Guyana Forestry Commission and the Guyana Gold Board.
Guyana Forestry Commission	The GFC provides forest policy, regulatory and forest laws advice. Responsibility for distribution of forest lands and sustainable forestry management systems and protocol design and compliance.
GSDS Inter-Ministerial Committee	This group is a high-level policymaking body with responsibility for sectoral policy inputs and integrating Guyana's green programme into sector programmes. The committee's mandate includes collaborating with non-State stakeholders.
Green Multi-Stakeholder Steering Committee	This committee is a LCDS and GSDS consultative mechanism comprised of local, community-based, regional and national representatives. Its overall responsibility is to help shape Guyana's green programme and encourage multi-level, multi-stakeholder ownership for the country's green transformation.

Meeting the skills and other labour requirements is a national and multi-sectoral policy pillar for the Government. The GSDS Framework outlines broad skills requirements within each of its seven central themes. The final consultation and stakeholder engagement exercises are expected to detail and deepen thematic and issue-based sectoral and national green skills strategies and structures. Pertaining to training and skills requirements priorities of the national adaptation architecture, Guyana's Second National Communication (SNC) to the UNFCCC identifies the following skills gaps:

- a) Capacity to undertake and interpret climate change projections;
- b) Conduct research on the vulnerability of key sectors and regions to the impacts of climate change;
- c) Implement and maintain the technologies and equipment necessary to monitor climate change and climate-related impacts; and
- d) Develop technologies, such as sea defences, irrigation systems and early warning systems,

which are critical to successful adaptations.⁶⁸

At the sector level, key skills and coordination gaps pertain to:

- a) Gaps in knowledge and skills in understanding the relationship between process or activities and greenhouse gas (GHG) emissions released;
- b) Integrate climate change and environmental sustainability policies and practices;
- c) Climate modelling, forecasting and integrating data sector and operational planning;
- d) Technical capacity to establish Implement and maintain low emissions technologies; and
- e) Training to inform appropriate responses and skills requirements for greening and climate resiliency measures.⁶⁹

⁶⁸ Second National Communication to the United Nations Framework Convention on Climate Change. Government of Guyana (2012). Pg. 339.

⁶⁹ Second National Communication to the United Nations Framework Convention on Climate Change. Government of Guyana (2012). Pgs. 339 – 346.

Table 9. Institutions Supporting Skill Development for Green Jobs

MECHANISM	MANDATE AND ACTIONS RELATING TO SKILLS FOR GREEN JOBS IN GUYANA
Board of Industrial Training	Comprised of representatives from public sector, commercial private sector and academia, the BIT is responsible for the provision and oversight of core and technical training competencies across a range of specialized disciplines aligned to labour market skills and employment requirements. The BIT is currently preparing to realign its policies, programme content and delivery and facilities in keeping with Guyana's economic and green restructuring.
TVET Council	Established in 2004, the council provides TVET-related policy advice to the Ministers of Education, supports the design, oversight and quality standards of the TVET system including the relevance of industrial training programmes to Guyana's economic and development needs.
Office for Climate Change	The OCC engages in public and sector-specific climate change awareness and education and technical training across government ministries and agencies integrating climate adaptation and mitigation in their programmes and sector policies.
Ministry of Communities	The Local Economic Development (LED) Committee was introduced in Guyana's local government system in 2012, local government economic development planning committees were subsequently established. The LED Committee and its planning bodies with support from the Ministry of Communities is rolling out phased training for greening regional and local development plans and community awareness.
Ministry of Finance - Budget Office	The Ministry's Budget Office collaborates with government ministries and agencies on green investments, programmes and development objectives training aligned to Guyana's green programme.
Mining School	The mandate of the Mining School includes soft and hard skills training e.g. ecosystems and environmental sustainability, mercury free gold mining for industry officials and other stakeholders. Training courses and programmes are being reviewed and expanded to ensure linkage and compliance with environmental sustainability, biodiversity, forestry management and low emissions in keeping with Guyana's green programme.
NAREI / GSA / GUYSUCO	The scope of NAREI and GSA mandates cover the entire agriculture sector, as the former includes some engagement in forestry, i.e. mangrove restoration and agroforestry. The scope of training by GUYSUCO pertains to sugar cane and prospective sugar producing crop cultivation and processing. Greening efforts by these entities have focused on mitigation, adaptation and climate- resilient policy development, integration and programmes to reduce environmental and climate stress on crop varieties, farm management, reduced GHG emissions, and enhancing integrated farming and agriculture resource-efficiencies.
NCERD	The NCERD is Guyana's central education management and planning agency. Its responsibilities include teacher training, undertaking curricula reform and quality assessments, ensuring learning environments and facilities meet or exceed quality standards and policy formulation inputs. In relation to education for sustainable development and Guyana's green economy, it implements the ESD policy and provides operational and technical assistance for the Guyana Education Sector Improvement and Secondary Education Improvement Programmes.
University of Guyana	Under the Education Sector Improvement Project, the University is revising programme curricula to strengthen research and learning-by-doing requirements for students and academic staff. Collaborating with UNESCO, regional and national stakeholders, it carried out needs assessments, skills training and preliminary curricula revision under Guyana's Climate Change Education for Sustainable Development programme. Pertaining to climate change and environmental sustainability, the FEES is the University's leading education and skills training provider. The Institute of Development Studies implements sustainable development programmes and workshops.

Skills for Green Jobs in Guyana

Skills requirements and labour market implications for greening, mitigation and adaptation have received coverage in numerous national studies, assessments and reports. However, at the time of reporting, cognizant of the ongoing green state preparation, there is no clear plan of action to integrate labour market restructuring strategies and coordinated actions within the current green framework. The drivers of prevailing labour restructuring measures are not systematized, nevertheless as reported in Section 4.3, they are recognized as national educational reform to strengthen STEM subjects and deepening of climate change, biodiversity and sustainable development education and attention to socio-economic and demographic vulnerabilities. At the time of this report, national and sector level institutional skills for green jobs mechanisms were not yet designed or established. Policy actions have mostly relied on existing institutional arrangements, each with varying accommodative levels of policy, structure and capacities, to effectively discharge and absorb requisite institutional and human capacity green skills training and labour restructuring. These institutions include:

The constituent parts of Guyana's green programme broadly interlink emerging skills and labour market restructuring requirements respectively. In lieu of greening and restructuring the economy, the Government is preparing to adopt a more systematized labour response that builds on current efforts oriented towards anticipated generic educational and skills requirements. The following mitigating policy gaps require urgent attention to streamline and give impetus to a labour response that is not delinked from national policies and actions towards restructuring and greening the economy:

- i) Policy coordination and prioritization of labour market challenges beyond generic and anticipated skills requirements;
- ii) LMIS tool capabilities;
- iii) Available labour and green jobs statistics; and
- iv) Sector and thematic analyses of skills requirements.

5. Analysis of case studies

Section 5 analyses eight case studies that further illustrate the linkages between skills requirements and broader labour market policy issues, and the concomitant implications reshaping Guyana's labour market structure and economy.

5.1 Micro and small enterprise (MSE) development and building alternative livelihoods for vulnerable groups

As referenced in section 4, one of the key GRIF-funded projects, MSE Development and Building Alternative Livelihoods for Vulnerable Groups (2013 to present, hereafter known as MSE Development project), has demonstrated its ability to build an enabling environment for MSEs, owned by or focusing on vulnerable populations,⁷⁰ to effectively operate in Guyana's business environment. The project works to support MSEs in increasing access to finance and building technical and business skills, while simultaneously operating in a context that minimizes negative impacts on the country's environment. The programme was designed in support of the World Bank's Country Strategy for Guyana (2008-2012) and under the LCDS, to support its mandate to move Guyana to a low carbon economy. The programme continues to operate in-line with the GSDS Framework, supporting the building of an inclusive enabling business environment for green economic growth. The executing agency is the Ministry of Tourism, Industry and Commerce (MINTIC), being led through the Small Business Bureau (SBB).⁷¹

⁷⁰ MSE Project Document states, there is no formal definition for vulnerable groups. However, for this project, vulnerable groups include: individuals and groups without access to credit and or appropriate business and technical training who have been affected by the restructuring of sectors such as mining, forestry, sugar and bauxite and/or those wishing to participate in one of the low carbon sectors. These individuals and/or groups must have a business or a business proposal in a low carbon sector.

⁷¹ Project Appraisal Document. Micro and small enterprise (MSE) development and building alternative livelihoods for vulnerable groups.

The Guyana Private Sector Assessment (2014)⁷² points to the challenge experienced by Guyanese small and medium enterprises (SMEs) in accessing credit. There are several reasons for this, one being, the banking industry is still comparatively small thus has limited tolerance for risks and tends to lend to large well-established corporations that have the ability to put up high collateral. For example, some banks require 150 per cent collateral, which would be nearly impossible for a SME. This issue is compounded considering most land is state-owned, thus small-scale farmers or miners do not have land to use as collateral. Additionally, most SMEs do not have the past experience that would provide confidence to banks, thus increasing their willingness to lend. In 2017, the World Bank ranked Guyana at 124 out of 190 in their Doing Business report.⁷³ The ranking speaks to levels of access to credit using such indicators as: strength of legal rights, depth of credit information, public registry coverage and private bureau coverage. Though an advancement from past years, this ranking still demonstrates a need for improvement.

SMEs contribute approximately 28 per cent to Guyana's GDS, demonstrating ample space for increased contribution.⁷⁴ The MSE Development project aims to address these referenced challenges and increase MSE contribution to the country's GDP, while supporting its shift to a green economy.

The Guyana GRIF Project Management Office provided the results data as of June 2017.

The project has created jobs for nine staff within the SSB to support its implementation. Moreover, the SSB estimates that as of June 2017, 1,019

⁷² Elias, Carlos. The Guyana Private Sector Assessment. Inter-American Development Bank. 2014.

⁷³ A World Bank Group Flagship Report. Doing Business 2017. Equal Opportunity for All Economy Profile, Guyana. International Bank for Reconstruction and Development / The World Bank, 2017.

⁷⁴ Project Appraisal Document. Micro and small enterprise (MSE) development and building alternative livelihoods for vulnerable groups.

Table 10. Sector focus for loans and grants to MSEs

	% LOANS PER SECTOR	% GRANTS PER SECTOR
Professional and business services	36	28
Fruits and vegetables	10.4	21
Agriculture and agro-processing	12.8	25
Arts and crafts	29	11
Manufacturing activities	4.8	6.2
Internet and computer-based services	2.4	5.5
Eco-tourism	3.2	0.6
Sustainable forestry and wood processing	1.6	0.6
Entertainment, music and the performing arts	1.6	1.0
Aquaculture	2.4	0.3
Apiculture	0.8	1.0
Energy efficient transportation and logistics	0.8	–
Publishing and printing	–	0.3

jobs were sustained and/or created as a result of 125 loans and 308 grants issued to MSEs working in low carbon sectors. More specifically, 580 jobs resulted from loans and 439 jobs from grants provided. Disaggregated by sex, 60.8 per cent of the loans were given to male-led MSEs and 39.2 per cent to female-led MSEs. Of the 308 grants, 42.9 per cent were male beneficiaries and 57.1 per cent female beneficiaries. Table 11 provides the sector focus for which the MSEs received loans and grants.

As noted in the Private Sector Assessment (2014), access to information and technical capacity are major barriers for MSE development. This project made great strides in addressing these issues. As of June 2017, 2,509 persons have been trained in areas of business management, record keeping, packaging and labelling, entrepreneurship for women, climate smart agriculture, videography, photography, cosmetology, cookery, and crafts.

Phase 1 of the MSE Development project ends December 2017. At this time, an assessment will be carried out that will include the following data sets: 1. priority sectors; 2. low carbon activities; and 3. vulnerable groups. This data will be used to evaluate the impacts and benefits of phase 1 of the MSE Development Project. Furthermore,

the data collected through the assessment will support the more effective and efficient implementation of Phase 2. A critical component of the continuation of Phase 2 will be the Skills Voucher Scheme, worth US\$1.42 million.

The Skills Voucher Scheme will build on the training success of phase 1. Qualifying MSEs will be given vouchers that can only be used to enroll in training programmes at approved entrepreneurial development and training institutions. Training themes focus on business management, marketing, financial systems, and other relevant courses that build technical skills for MSEs to operate in a low carbon sector, such as sustainable mining or forestry.

5.2 Bartica – Guyana’s green pilot and model green town

This case study demonstrates the government’s commitment to the GSDS central theme: Resilient Infrastructure and Spatial Development: Inclusive and Green Urban Settlements. Though the GSDS is not yet finalized, the Framework is already guiding government actions. The

Table 11. Goals of Bartica LED Plan

Goal 1 is to transform Bartica into a model green township for Guyana and the Caribbean with a focus on 3 objectives: 1. Completely rehabilitate the Tumatumari (or similar) hydropower station; 2. Increase the use of solar power in Bartica; and 3. Improve solid waste management in Bartica.

Goal 2 is to transform Bartica into an Information and Communications Technology (ICT) Centre of Excellence. The aim is to turn Bartica into a College City focusing on ICT that will attract students country-wide.

Goal 3 is to increase Bartica's agricultural production so that the township and Region become self-sufficient in food production, and eventually a net food exporter, with 3 objectives: 1. Prepare an Agricultural Development Plan (ADP) for the township and adjacent parts of Region 7; 2. Lobby for NAREI to increase its complement of extension Officers, support staff, equipment and material to implement the ADP; and 3. Implement the ADP for Bartica and its environs.

Goal 4 is to increase the Technical and Vocational Education and Training (TVET) capabilities of Bartica's residents so that Bartica can play a larger role in providing support services to mining, forestry, transport and other industries, with these 3 objectives: 1. Increase Technical and Vocational Education and Training (TVET) opportunities at Bartica and Region 7 Secondary Schools; 2. Increase TVE training opportunities offered by HOPE Foundation NGO; and 3. Establish an internship / mentoring programme for TVET students.

Goal 5 is to increase the Specialized Tourism sector in Bartica with the following 3 objectives: 1. Increase sports / recreational / entertainment tourism activities; 2. Increase government, donor and NGO events tourism activities; and 3. Increase business events' tourism activities.

Goal 6 is to increase the Small Business Management capabilities of Bartica residents.

Goal 7 is to increase housing development for Bartica residents, with 2 objectives: 1. Complete allocation and handover of existing CHPA housing schemes, and 2. The Bartica Town Council becomes the lead agency for new housing schemes, and establishes a new housing scheme.

government sees this central theme as an opportunity for the urban areas to become education centres, or as stated in the GSDS, "breeding grounds of entrepreneurship and knowledge exchange".⁷⁵

The Government identified Bartica, a town in Region 7, to be Guyana's first Model Green Town. In 2016, the Bartica Green Development Plan⁷⁶ was developed, which builds off the town's LED plan.⁷⁷ As a model green town, green initiatives will be piloted that other municipalities can look to, learn from, and duplicate. The greening of Bartica, as well as other municipalities, is leading a shift in economic activity, thus changing the labour market. New jobs are being created that require new skill sets, while others will require retraining in existing fields.

⁷⁵ Guyana's Office of the Presidency and the United Nations Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017.

⁷⁶ A final version of the Bartica Green Development Plan has not yet been released to the public.

⁷⁷ Singh, Joseph. Sustainable Livelihood and Entrepreneurial Development Initiative (SLED). Development of Local Area Economic and LED Strategic Plans-Bartica Township. Local Economic Development (LED) Strategic Plan. Guyana.

A recently completed economic profile of Bartica⁷⁸ points to mining, namely gold, and retail having been the two dominant sectors traditionally in Bartica. This dependence on just two sectors made Bartica's economy very vulnerable to even slight changes in the market. This was demonstrated when the price of gold drastically dropped in 2013 to 2015, thus critically affecting livelihoods.

Table 11 presents the seven goals of the LED plan, their objectives and the training and retraining needs to support the changes in the labour market as the economy diversifies and Bartica becomes a model green town.

In support of these goals, the following areas of expertise are needed:

- Green architects;
- Engineers;
- Hospitality in a green environment;

⁷⁸ Singh, Joseph. Sustainable Livelihood and Entrepreneurial Development Initiative (SLED). Development of Local Area Economic and LED Strategic Plans-Bartica Township. Local Area Economic Profile. Guyana.

- Green Procurement;
- Maintenance of green spaces;
- Energy Audits;
- Facilitating recreational activities in green spaces;
- Green educational programming;
- Installation and maintenance of solar energy equipment;
- Solid waste management and recycling;
- Energy efficient transportation services;
- Green construction techniques;
- Traditional occupations will still exist, such as taxi services, painters, plumbers, carpenters, and electricians, but they will need to learn to operate in a greening economy.

Historically, Bartica did not have an adequate pool of experts to meet the labour needs in its traditional sector of mining; therefore, experts came from outside the town. Needless to say, with such economic diversification taking place, there are increased gaps between skills and labour demand.

In order to build the capacity of Bartica residents to support this green shift, there has begun great collaboration among government, private sector, non-profit sector, donor community and civil society in general. With the Ministry of Communities being the town's lead partner coordinating with the Mayor of Bartica and the Town Council, other supporting ministries have been: Education, Agriculture, Presidency, specifically the Office of Climate Change, Business, and Labour.

At the government level, training content is now being developed and will include such topics as green growth sensitization and green programme planning, that includes knowledge on renewable energy and similar. Training will take place at all levels of government from ministerial to municipal.

The University of Guyana and TVET have had a direct role in supporting the development of programmes that will provide the needed skills training to meet new labour market demand in Bartica. Through scholarships and non-resident

skills initiatives, the University plans to scale up its offering of programmes for solar installation and maintenance, ICT and sustainable agriculture. In addition to the support from the University of Guyana to build skills in the agriculture sector, other entities engaged in this effort are: National Agricultural Research and Extension Institute, Guyana School of Agriculture, and the Guyana Livestock Development Association.

Furthermore, in the University's recent effort to update and revise curricula in four of their faculties, other green skills and knowledge requirements were considered. TVET traditionally has provided training in the key sectors of mining, forestry and transportation to include primary and support positions within the sectors. TVET now has the opportunity to strengthen its curriculum so that it aligns with changes in the labour market as the town greens, thus providing ample opportunities for Bartica residents to receive the required skills training and becoming fully employed.

The Hope Foundation, a community-based non-profit, in partnership with the Board of Industrial Training (BIT), will serve as the lead implementer of technical and vocational training initiatives for youth and other stakeholders in Bartica. The BIT finances, trains skilled facilitators and provides training resources to effectively deliver these programmes. Training in the following fields are currently offered: micro, small and medium enterprise development, heavy-duty machine operating, welding, machining and fabrication, catering and cake decorating, basic computer skills, electrical installation, life skills, entrepreneurship, HIV awareness and health issues. This menu of courses will expand to support the areas of expertise needed to move the town towards a green economy.

Considering official public release of the Green Bartica Development Plan has been put on hold and greening efforts are at the nascent stage, there is limited data on employment and training statistics. With that said, the research team visited Bartica and learned that the following initiatives are in progress:

- The Green Park;
- Piloting of solar PV street lights at Three Miles Secondary School;

Skills for Green Jobs in Guyana

- Development of a Renewable Energy plan for the entire town;
- Development of a Sustainable Land Use Management Plan that includes sites for low carbon agriculture and agro-processing, wastewater treatment system, recycling and landfill sites, and a regional airport;
- Community and regional-based nature tours, such as the Bartica Safari Tour and Bartica Regatta.

During the visit, the Mayor of Bartica, Mr Gifford Marshall, elaborated on the vision for Bartica as a Model Green Town. He explained,

“The Bartica Development Plan includes milestones for five, ten and fifteen years. As referenced earlier, Bartica will act as a site to test a range of green initiatives, such as solid waste management, recycling and composting. A focus will be on being a town of Green Citizens. This will be done through awareness programmes such as the use of billboards or competitions for school-age children that integrate green themes.”

5.3 Education sector reform to support Guyana’s green programme: University of Guyana Science and Technology support project

This case study demonstrates how the University of Guyana (UG) is responding to labour market and policy changes as the country shifts to a green economy. It will speak to the World Bank’s US\$ 10 million-funded project (2011-2017), University of Guyana Science and Technology Support. The ultimate goal of the project was to support UG in better aligning its curricula to meet the industry labour market demand as the economy shifts green, through working directly with four science and technology faculties, being: Natural Sciences; Technology; Earth and Environmental Sciences; and Agriculture and Forestry. This case will concentrate on the Faculty of Earth and Environmental Sciences (FEES).

The LCDS named investment in human capital as a priority and made the commitment to incorporate low carbon development and climate change themes into the national education curriculum. This would be realized through strengthening formal education initiatives with a concentration on Guyanese youth.⁷⁹

Though the project was started under LCDS, the results greatly support the aims of the GSDS. Throughout the GSDS Framework, there are numerous references to skill needs and development. Under the central theme, Human Development and Well-being, it specifically speaks to reorienting curricula as the economy greens to “equip the populace with the right skills, knowledge and attitude to achieve an inclusive and sustainable future”.⁸⁰

Participatory dialogue was a key element of the process for UG to identify and address knowledge and skill gaps occurring in the labour market because of the green shift. An Advisory Steering Committee oversaw implementation. The Committee conducted outreach to students and employers through written surveys and interviews. Expertise needs identified were:⁸¹

- a) GIS and Remote Sensing;
- b) Climate Change and Climate Modeling;
- c) Hydrology (Water Resource Management);
- d) Ground Water Management;
- e) Renewable Energy (bio fuels, solar energy, hydroelectricity etc.);
- f) Agriculture Resources Management;
- g) Sustainable Forestry;
- h) Natural Resources Management;

⁷⁹ Office of the President of the Republic of Guyana. A Low Carbon Development Strategy (LCDS): Transforming Guyana’s Economy While Combating Climate Change. May 2010.

⁸⁰ Guyana’s Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017.

⁸¹ Project Appraisal Document on a Proposed Credit in the Amount of SDR 6.2 Million (US\$10 Million Equivalent) to the Co-operative Republic of Guyana for the University of Guyana Science and Technology Support Project. 23 May, 2011. World Bank/Caribbean Country Management Unit.

- i) Food and Nutrition Technology;
- j) Land Use Planning; and
- k) Biodiversity Inventory and DNA Analysis.

This data was used to guide the curricula revision process during the project. In a conversation with FEES, they more specifically identified the following as most relevant to their faculty: baseline data collection, species identification, hazard mapping, hydrologic modeling, urban greening, green engineering, and sustainable utilization of resources. These additional revisions will support students to enter the sectors of mining, tourism, forestry, and energy, as they all become more focused on green and sustainable practices. Along with the curricula changes, the teaching methodology took on a more practical approach, which includes use of guided field exercises for baseline data collection, analysis, and modeling, as well as increased use of GIS tools. Historically, graduates of FEES mostly moved on to employment with government entities, the Environmental Protection Agency, Guyana Geology and Mines Commission, Guyana Forestry Commission, Protected Areas Commission, and Central Housing and Planning Authority. Considering the new curriculum⁸² just went into effect for the 2016-2017 school year, it is expected that employment opportunities for future graduates will expand beyond the public sector.

In order to continue monitoring changes in the labour market and keep the curriculum current and relevant, FEES has several strategies. Through social dialogue, FEES is able to regularly participate in national and regional policy discourse; serve as member of national Boards; and conduct academic research. A significant aspect of the project was that of research grants for topics of low carbon development. Another mechanism is through strengthening the alumni association, which can allow regular communication with graduates to know their employment situation, track industry changes, and receive feedback on how their degree prepared them for such employment. This information can be used to provide guidance

to future graduates through regular student counseling sessions, which is a significant mechanism for such information exchange. FEES consultancy services, where they provide expert guidance on key environmental issues of the country for public and private entities, is also of value in providing them with data to inform future policies and programmes. Moreover, such consultancies support building awareness of stakeholders on the greening of the environment.

It should be noted that the project was able to identify training needs outside of these four key faculties and look at university support programmes. One illustrative example is that training is now being developed for the Facilities Management Office that will concentrate on skill needs to support greener buildings and operations. Moreover, in addition to skills development and curriculum revisions, the project was able to renovate 30 buildings on campus, updating classrooms and labs.

Though the project ends this year, there is a complementary project being initiated that will focus on pre-primary, primary and lower secondary school levels. Additionally, it will work with UG's Faculty of Health Sciences. This is the World Bank-funded, Guyana Education Sector Improvement Project (2017-2023) which has the following two objectives: 1. improve teaching practices and student achievement in mathematics at the primary level in selected schools; and 2. strengthen the teaching capacity and improve the learning environment of the UG FHS.

The project will have three main components:

- a) Integrated Curriculum Reform;
- b) Strengthening the Teaching Capacity and Improving the Learning Environment for the University of Guyana Faculty of Health Sciences;
- c) Project Implementation Support.

In a conversation with a World Bank representative supporting this effort, she emphasized that the project will begin with a focus on strengthening Mathematics and English programming and that UG will continue to be

⁸² The Faculty of Technology launched their new curricula for the 2015/2016 school year, and the other faculties launched at the start of the 2016/2017 school year.

a critical partner. Another essential partner will be the National Center for Education Resource Development (NCERD), who pointed out that it will be essential for teacher training to evolve as the curriculum is revised. NCERD offers in-house training for teachers twice annually on all courses. They said out of the new curriculum will emerge new training areas, which will be incorporated into this training. NCERD will coordinate with the Cyril Potter College of Education so that there will be guaranteed alignment in programming as curriculum is revised.

5.4 Mangrove restoration project – sustaining alternative community livelihoods through improving coastal resiliency

This case study will focus on the necessity to protect Guyana's mangroves to support the country's transition to a low carbon economy; and more generally, its move to an inclusive, green economic and social development path. It will discuss one of the most influential programmes addressing this issue, the Guyana Mangrove Restoration Programme, focusing on the project's success with job creation and new skills building to support green sector development. The initial project (2010-2013) was funded through the European Union for € 4,165,000. The project is a replicable model for collaboration among national and local government with communities to support the building of employment and training opportunities within the framework of a green economy. The project was implemented through the Ministry of Agriculture's National Agriculture Research and Extension Institute (NAREI). In 2014, upon project completion, the Mangrove Restoration Project Unit integrated into NAREI's structure, as the Mangrove Restoration and Management Department. This Department is a permanent entity that continues to build from the foundation built within this project.

There is no specific legislation protecting mangroves in Guyana. Mangrove protection

and preservation clauses are however found in the EPA Act, Sea Defence Act, Fisheries Act and Forestry Act.⁸³ These clauses, as well as a Ministerial Declaration in 2011, classified the red, black and white species of mangrove as protected, therefore making it unlawful for anyone to destroy them.

Over recent decades, the mangroves of Guyana have been threatened not only by climate change effects, but also by human activities, such as cattle grazing, illegal solid waste disposal, illegal mangrove timber harvesting for fuel, hunting, and boating. The Mangrove Restoration Project has attempted to replace some of the illegal and unsustainable income generating activity with new livelihoods, that both support mangrove conservation and sustainable economic growth for the surrounding communities. This Project directly contributed to employment at the community and institutional level; the mangrove project management team evolved into a fully-fledged department.

Of further significance, eight Community Mangrove Action Committees were established in Regions 2, 3, 4, 5 and 6, consisting of 78 community volunteers, some of whom are deployed as Mangrove Community Stewards.

Overall new skills training included planning, harvesting and maintaining mangroves; mangroves and sea defence; and mangroves and enterprise development. Importantly, these skills are applied to a process which ultimately will increase Guyana's carbon sequestration capacity, strengthen integrated coastal zone resiliency, reduce flood risk and impact and provide community-based livelihood employment. Replicated and taken to scale across Guyana's mangrove forest cover, it could potentially create a significant skilled labour demand and encourage further skills training and education that can be applied in the forestry and low carbon sectors.

Several restoration intervention and enterprise development initiatives took place during the life of the project as detailed below:

- i) *Mangrove Seedling Planting initiative* – carried out in 16 communities resulting in 300 persons being employed from 2010 to 2016

⁸³ Mangrove protection legal framework matrix.

Table 12. Employment created through the Mangrove Restoration Project

DESCRIPTION (PART-TIME)	NUMBER OF PERSONS EMPLOYED	REMARKS
Seedling nurseries	171	
Seedling/spartina planting	300	
Monitoring	310	5 community members per site per period. Some persons maybe engaged for several cycles at individual sites
Infrastructure projects	140	Average across construction of brushwood dam projects
Tours (guides etc)	6	
Total	927	
DESCRIPTION (LONG-TERM AT INSTITUTIONAL LEVEL)	NUMBER OF PERSONS EMPLOYED	REMARKS
Project Management	6	
Rangers	9	

to support mangrove seeding. Furthermore, there was regular monitoring taking place which allowed for temporary employment for approximately 310 persons, which consisted of five community members per site per period. Volunteer planters recruited from schools, the business community and civil society supplemented remunerated community-based planters.

- ii) *Coastal Infrastructure initiative* – carried out in nine communities employed approximately 140 contractors from the local communities.
- iii) *Spartina Grass Planting and Harvesting initiative* – took place in seven communities and employed approximately 300 community members. This activity was implemented in collaboration with NDCs, farmers and other stakeholders. The initiative identified spartina grass planting and harvesting sites, and provided payment to local harvesters who were trained in mangrove harvesting and planting.

The Mangrove Restoration Project innovatively linked community engagement via monitoring, maintenance and community enterprise development to preservation of the socio-economic benefits of mangrove carbon sequestration services and natural sea defence systems. In exchange for enterprise development

and business assistance services, community participants agreed and are trained to actively monitor the mangrove restoration progress and use of mangrove forests in collaboration with their NDCs, RDCs and NAREI. A few enterprises started were:

- Cottage Industries – assistance was provided to three women's groups involved in agro-processing and distribution of mango and tamarind 'achar' condiments, meat and food seasoning and pepper sauce. Women from these groups, through their respective organizations, became members of Guyana's National Women's Agro-processors Network.
- Beekeeping - Guyana is home to an estimated 300 beekeepers and 2,000 hives, some of the latter are in mangrove forests. The tradition of setting hives in mangrove forests in Guyana dates back many decades. Stanford (1983) observed that in Guyana, the main species for pollen and nectar production are the black mangrove, button wood and white mangrove.⁸⁴ Average honey production from the mangrove is about 25-30kg per colony.

⁸⁴ For additional details on mangrove species in Guyana and their nectar producing variations, visit <http://guyanachronicle.com/2010/10/23/apiculture-and-the-honey-mangrove>.

Skills for Green Jobs in Guyana

Thus, it was strategic for the project to connect apiculturists with mangrove protection. Novice and seasoned apiculturists received equipment, as well as market development and branding support for their honey in exchange for protecting and managing 3km of mangrove forest each. Training modules covered: 1. Introduction to Apiculture; 2. Introduction to Apiary Management Principles; 3. Apiary Management Principles II; and 4. Hive Construction. A total of 18 persons were trained from seven communities (eleven females and seven males).

- Nature Tourism – The Belfield/Victoria Mangrove Forest is one of two current locations proposed for designation as a national protected area, the other is the Fort Welling mangrove forest in Mahaica, Berbice. The Belfield/Victoria Mangrove Heritage Tours enterprise initiative provides daily tours incorporating community history and mangrove education. Six community residents were trained as tour guides and tourism marketing specialists.

In total, from nature tourism efforts, 15 Tour Guides were trained (nine females, six males); 16 Birding Guides (eight females, eight males); 2 Horse Carriage Drivers; and 2 Drummers.

5.5 Planning Guyana's green energy transition

This case demonstrates how Guyana's energy sector is preparing for a shift towards 100 per cent renewable energy to meet the country's energy needs. It speaks to the challenges of an inadequate pool of qualified experts to support such a shift, as well as effective training programmes currently supporting retraining and training for new occupations occurring due to this shift. It provides illustrative examples from both the public and private sectors.

This transition has been guided by the LCDS and currently, the GSDS Framework. The LCDS committed the country to moving its economy on a low carbon development

course, with the aim of reducing non-forestry emissions by 30 per cent using clean energy by 2020. This would be supported through prioritizing investment areas of: hydropower; fiber-optic cables/technology, agro-industrial infrastructure, and bioethanol production.⁸⁵ This transition is working to mitigate the negative effects of climate change, as well as reducing dependency on energy imports.⁸⁶ All identified investment areas would open new employment opportunities.

Even prior to the development of the LCDS, such programmes as the Unserved Areas Electrification Programme (2004 to 2010) stimulated the move towards renewable, clean energy, that being solar. This programme explicitly stated:

*“The government will examine ways of providing electricity to unserved areas in the hinterland in the most cost-effective, sustainable and environmentally benign manner while at the same time increasing benefits associated with electricity. There will be training plans aimed at strengthening the professional capabilities and at promoting a cleaner and more rational use of conventional energy, its efficient use and that of renewable energies”.*⁸⁷

This project installed 1,750 solar systems, utilized a mix of skilled and local supportive labour. Data on the precise number of jobs created, public awareness and number of persons trained were not available. With this new focus on renewable energy came the need and demand for new skills.

More recently, under the GSDS Framework, Guyana continues this energy transition commitment. One of the seven central themes of the GSDS is: Energy – Transition towards

85 Office of the President of the Republic of Guyana. A Low Carbon Development Strategy (LCDS): Transforming Guyana's Economy While Combating Climate Change. May 2010.

86 88 Guyana imported US\$300-600 million annually between 2012 and 2016 in petroleum-based fuels. Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017.

87 Hinds, Samuel A. “Government of Guyana Strategy for Underserved Areas Electrification Programme.” (2001). http://digitalrepository.unm.edu/la_energy_dialog/149.

Renewable Energy and Greater Energy Independence. To support this aim, Guyana has decided to prioritize: hydropower, wind power, bagasse, biomass, solar power, biofuels, and biogas. The country still plans to utilize its petroleum resources to advance its green programme with the hope of establishing a Sovereign Wealth Fund.⁸⁸ The current energy goals and targets contribute towards SDGs 7 (affordable and clean energy), 8 (decent work and economic growth) and 13 (climate action).⁸⁹

With Guyana's active commitment to 100 per cent renewable energy by 2025 and the GSDS in the process of being finalized, efforts are on the way to make this commitment a reality. According to the GEA, *"the transition to green energy and increased energy efficiency has been the biggest structural change experienced by the sector in recent years. Government indicated its commitment to this change at the national and international levels and has decided to lead the way by ensuring that all government buildings will over the next five years convert to utilizing renewable energy and energy efficient technologies"*.⁹⁰ All this will require energy audits be carried out on government facilities.⁹¹ In so doing, this will require experts in this area, thus opening up new employment opportunities and training needs.

A GEA representative felt there was never a 'sufficiently qualified pool' of candidates for the energy sector. Likewise, with the shift towards renewable energy, there still is not an adequate qualified pool of experts. With that said, she felt tertiary education facilities were taking the proper steps to adjust their curricula to try to address these skill gaps. For their internal

expertise needs, GEA is preparing for this shift through integrating these considerations into the development of their ten-year Human Resource Development Plan, which is part of a Technology Action Plan under the Technology Needs Assessment Study.

GEA points to several new occupations coming online due to the shift towards a green economy. These are:

- a) O & M technicians for renewable energy projects;
- b) Energy/environmental economists;
- c) Financial analysts;
- d) Hydropower design engineers;
- e) Energy auditors;
- f) GIS technicians;
- g) Biochemical engineers.

Specific to GEA internal operations, new occupations needed to support this shift are:

- a) Project managers with knowledge of clean and renewable energy;
- b) Engineers for wind, biomass and hydropower project development;
- c) Financial analyst;
- d) Engineering technicians (electrical & mechanical);
- e) Energy economist.

GEA directly supports skills development to meet the needs of this shift in the following ways. They provide in-house training for current staff and focus on recruitment of new staff who possess the needed expertise. They coordinate directly with higher education facilities to advise on curriculum development. Specifically, they are collaborating with the University of Guyana and TVET institutions to update electrical engineering and renewable energy courses, as well as the introduction of courses and programmes pertaining to Guyana's emerging petroleum sector. Additionally, GEA is reviewing required licensure and certification updates for standardizing skills and professional competencies and practices for renewable energies. Moreover, the GEA regularly collaborates with the Ministry of Education

88 A Sovereign Wealth Fund (SWF) is a state-owned investment fund that is made up of surpluses from official foreign currency operations, proceeds of privatization, governmental transfer payments, fiscal surpluses and/or receipts resulting from resource exports. These monies can be used for investment purposes to benefit the country's economy and citizens. <http://gina.gov.gy/guyanas-sovereign-wealth-fund-for-public-consultation/>.

89 www.undp.org/content/undp/en/home/sustainable-development-goals.html.

90 Mahender Sharma, CEO Guyana Energy Agency (GEA) (Email Communication July 2017).

91 Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017.

Skills for Green Jobs in Guyana

to conduct energy awareness activities in schools, participate in career fairs, and provide information materials to students and schools. Similarly, they support the private sector through expert advice and guidance through hosting seminars with focus on RE and EE.

To assess the private sector response to this transition, the research team conducted interviews with three organizations that have demonstrated significant internal greening efforts. Their efforts include a strong focus on incorporating the use of renewable energy sources. These companies were Qualfon, who provide business processing outsourcing services; Demerara Bank Limited, who offer green financing; and Nand Persaud Group, made up of a variety of firms specializing in activities from call centres to installation of solar systems to rice processing and packaging.

Overall, the companies' greening efforts have been motivated by personal values, a need to protect the country's natural resource base, empowerment of their human resource base, and government incentives that can lead to cost savings. One illustrative government incentive is the elimination of import duties on equipment brought in for use in accessing renewable energy sources. All three organizations referenced are good models for Corporate Social Responsibility (CSR) practices that can support Guyana's economic and social development.

Some common observations that arose during the interviews indicated that greening can initially be costly, thus acts as a limitation for many businesses, and the expertise needed to move in such a direction can be difficult to find. Such expertise needed to support their efforts were: green architecture, solar energy installation and maintenance, advanced level electrical engineers, and simply general understanding of concepts such as CSR or sustainable development. It was felt that other companies may be encouraged to follow a similar path if awareness within the private sector on the value of green practices increases and expertise support is more available. Moreover, it was felt it would be of value if the government considers further revisions to taxation policy so that policy incentivizes companies moving in this direction.

Overall, this case study demonstrates the foundation has been laid through policy and initial funding of programmes for Guyana to fully transition to renewable energy. With that said, many in the private sector are responding piecemeal, speaking to a need for greater incentives within this sector and a need to develop a qualified pool of experts that can support this transition.

5.6 Skills training for climate smart agricultural adaptation and resilience

Through introducing new climate resilient farming practices, or climate smart agricultural (CSA) practices, the Ministry of Agriculture (MoA) is leading the effort to mitigate the negative effects from climate change on Guyana's agriculture sector. This both involves a policy and implementation commitment from MoA and its partners to protect the livelihoods of farmers and the agriculture sector of Guyana from the devastating effects of climate change.

According to the MoA statistics, the agriculture sector in Guyana contributes approximately 20 per cent to the country's GDP and is responsible for over 33 per cent direct employment.⁹² With agriculture being a major contributor to Guyana's economic prosperity and development, the negative effects of climate change on this sector are a significant threat to the country's economic and social development. As a result of climate change, both the frequency of drought and flooding has increased in Guyana. Moreover, temperatures are projected to rise 1°C to 2°C over the next four decades,⁹³ which will contribute to a rapid rise in sea level. Considering that Guyana is approximately 1.4 metres⁹⁴ below sea level already, Guyana's food security and

92 Ministry of Agriculture (2013). A National Strategy for Agriculture in Guyana, 2013-2020: Agriculture - Our Vehicle for sustained Economic and Social Prosperity: Vision 2020. Guyana. Ministry of Agriculture.

93 <https://guyanachronicle.com/2016/10/15/the-holdgate-report-on-climate-change>.

94 www.caribank.org/news/cdb-announces-support-climate-smart-agricultural-sector-guyana.

economic development are both in peril. The fact that over 90 per cent of the Guyanese population live in the coastal regions,⁹⁵ where the land is most fertile and valued for agricultural production, speaks to the urgency to address this problem.

Several programmes have been initiated by both the Guyanese government and international organizations to build technical capacity in support of CSA. In 2015, the IDB set up the Regional Climate Smart Agricultural Fund.⁹⁶ In July 2017, the Caribbean Development Bank approved a project for US\$295,000, that will support Guyana in developing a framework to address the impact of climate change on its agriculture sector.⁹⁷ This will then support the development of a capacity building programme. The German Agency for International Cooperation (GIZ) implemented a training programme on CSA as part of the Integrated Climate Change Adaptation Strategies (ICCAS) programme. Currently, CSA is a key component of the curriculum at the Guyana School of Agriculture⁹⁸ and the Faculty of Agriculture and Forestry at the University of Guyana.

The MoA, leading CSA efforts, recognizes the threats from climate change and in their 2013-2020 National Strategy for Agriculture, have laid out the roadmap to address them. The strategy consists of 25 priority areas for Guyana's agriculture sector. CSA is referenced many times throughout the strategy and most prominently in priority area 18: Promote Environmental Sustainability/Climate- Smart Agriculture. Priority 18 focuses on several initiatives such as establishing a Climate Change Committee within MoA, reducing emissions, compiling best practices for climate change adaptation in the

agriculture sector, and conducting training for extension agents and farmers on such techniques.

Additionally, priority area 19 specifically speaks to developing Guyana's Agriculture Risk Reduction and Disaster Management programme, which is a focus on adaptation and mitigation initiatives to prevent and manage floods and droughts, as well as prevent disease outbreaks. Specifically, the strategy committed to developing and publishing guidelines on CSA methods and technology to support educating farmers across the country on such practices. The CSA Guide was published in 2015 and used by research and extension officers as a field guide for their work with farmers.

In support of priority area 19, the MoA, in coordination with the Civil Defence Commission (CDC), and UN Food and Agriculture Organization (FAO), developed Guyana's Disaster Risk Reduction and Disaster Risk Management (DRR/DRM) Plan for the Agriculture Sector (2013-2018). This programme commits to promoting public awareness and education on CSA approaches and best practices in agricultural communities. Furthermore, it committed to assessing the training needs of MoA staff and other government entities supporting the DRR/DRM plan, then establish programming to address these training needs. Disaster Risk Management Systems have been prepared for six of Guyana's ten administrative regions, by the first quarter of 2018, the remaining regions are expected to have fully operationalized systems.

The following types of training are prioritized through this programme to support the DRR/DRM plan:

- ▶ Train engineers and technicians in using hydrology and hydraulics software to assist in development of early warning systems for floods;
- ▶ Training to carry out Vulnerability and Risk Assessments;
- ▶ Training to respond to changes in weather patterns and unusual ocean activity to support early warning systems;
- ▶ Training related to reduction of emissions capacity-building and tools to operationalize regional Disaster Management Committees.

95 <http://www.worldbank.org/en/country/guyana/overview>.

96 The Inter-American Development Bank (IDB) announced the approval of the \$5 million Climate-Smart Agriculture Fund for Latin America and the Caribbean (CSAF) to incentivize private sector companies in the region to invest in projects that increase farmers' incomes while addressing climate change. Created in partnership with the Global Environment Facility (GEF), the CSAF aims to unlock greater private sector investment in sustainable land use and climate-resilient agribusiness. www.iadb.org/en/news/news-releases/2015-07-16/climate-smart-agriculture-fund,11207.html.

97 www.caribank.org/news/cdb-announces-support-climate-smart-agricultural-sector-guyana.

98 <http://gsa.edu.gy/>.

Skills for Green Jobs in Guyana

The DRR/DRM Plan specifically speaks to identifying and transferring suitable technology and practices to promote the adoption of CSA among cash crop farmers.⁹⁹ One illustrative practice being promoted is that of shade-house farming¹⁰⁰ through the Shade-house Vegetable Production Project. In addition to promoting shade-house farming, the project also set-out to organize hydroponic¹⁰¹ and organic vegetable farmers into geographic clusters.¹⁰² This is a model CSA project started in 2014, with end date in 2018, being implemented by Partners of the Americas.¹⁰³ It received US\$ 1.3 million in funding from the Inter- American Development Bank/Japanese Trust Fund. A key aspect of this project is a focus on Guyana's most vulnerable populations.

This focus on vulnerable populations and inclusive development is a critical component of the GSDS. This is a core component of greening Guyana's economy. The GSDS speaks to "access to quality education and training facilities" as a strategic area of focus, as well as to prioritizing "human development and well-being" as a central theme. The GSDS Framework holds up a Do-No-Harm Approach, i.e. the application of, "participatory and inclusive processes and social cohesion principles".¹⁰⁴

One such vulnerable population that the Shade-house Vegetable Production Project engaged was Deaf¹⁰⁵ youth,¹⁰⁶ who face tremendous obstacles accessing equitable training and education programmes at all levels. The project partnered with the Guyana Deaf Association to work with four special needs schools: the David Rose School for Handicapped Children (Georgetown); the Special Needs School, East Bank Demerara (Diamond); the New Amsterdam Special Needs School; and the Linden Centre for Special Children. The project provided training in shade-house farming to the Deaf students for one year (2014-2015), with the expectation that once they leave the school system, they will have a skill set and level of expertise that can lead to viable employment opportunities. Furthermore, the project committed to the establishment of sustainable agriculture programmes at each of the participating schools, with the intent that they will act as a model for such climate resilient agriculture farming techniques, as well as continue to be a training tool for future students. Approximately 100 students, 12 teachers and some parents went through the training programme.¹⁰⁷

This programme is a model programme not only for climate smart agricultural farming, but can also be a model for inclusive design of skill-building programmes that will support Guyana's shift to a green economy.

99 Disaster Risk Management Plan for the Agriculture Sector, 2013-2018 for the Cooperative Republic of Guyana. Ministry of Agriculture, Civil Defence Commission, and UN Food and Agriculture Organization. April 2013.

100 Shade-house farming is a climate smart agriculture technique in that it allows crops to be grown year-round protected from pests in a shaded enclosure, thus eliminating the need for pesticides and less vulnerable to changes in weather. Moreover, there is no leaching of nutrients, no issue with weeds, and it is less-labour intensive while maximizing production. Agriculture Development and Food Security in Developing Nations.

101 In Guyana, the recycling method of hydroponics is utilized. This method referred to as a Nutrient Film Technique or NFT is implemented at NAREI. This is just one type of hydroponic gardening. This method involves the continuous flow of nutrient solutions through a system which is powered by a submerged pump. It is housed in a 50ft by 24ft wooden structure, with concrete filled base. A shade net is placed around the structure to deter the presence of insect pests. <http://agriculture.gov.gy/2016/11/21/narei-pushing-hydroponics-farming/>.

102 <https://guyanachronicle.com/2014/03/17/shadehouse-project-launched>.

103 www.partners.net/country/guyana

104 Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana

Green State Development Strategy and Financing Mechanisms. 28 March 2017.

105 Deaf (with a capital "D") refers to embracing the cultural norms, beliefs, and values of the Deaf Community. The term "Deaf" should be capitalized when it is used as a shortened reference to being a member of the Deaf Community.

106 The data does not exist on the total number of Deaf persons in Guyana or total number of school-aged Deaf youth enrolled and not enrolled in academic programs. In an interview with the Director of the Guyana Deaf Association, she estimated there were about 120 Deaf students enrolled in Special Needs Schools, with possibly a few in the mainstream school system. Personally, she was only familiar with one Deaf student who attended secondary school and knew of no Deaf student who has had the opportunity to attend university in Guyana. Even without accurate statistics, it can be said that the majority of Deaf youth neither have equitable opportunity to attend secondary school nor university. This reality greatly limits their employment opportunities, hence the ability to participate fully in green economic growth. It should also be noted that there is no data showing the number of Deaf persons employed.

107 www.inewsguyana.com/shade-house-farming-project-to-build-entrepreneurial-skills-among-disabled-students/.

5.7 Institute of applied sciences and technology: green research and development

This case study demonstrates new skills training to expand product value-chains that add a competitive advantage for vulnerable populations and grow the green economy. Furthermore, it is an example of public-private partnership working effectively for green economic development in support of the GSDS.

IAST, established in 1977, is funded through the Guyanese government and is considered an industrial research institution. Its mandate is to *“develop and adapt appropriate technology for the utilization of Guyana’s natural resources, so that these resources can be gainfully developed and exploited for the benefit of the people of Guyana”*.¹⁰⁸ IAST bases its programming on three pillars: 1. community development, 2. socially responsible models, and 3. a significant focus on indigenous populations. The institution consists of five departments: 1. Analytical Services, 2. Food and Feed, 3. Biofuels/Alternative Energy, 4. Indigenous Materials, and 5. Bio-Prospecting. Throughout their work, they engage directly with the Ministries of Indigenous Peoples’ Affairs, Social Cohesion, and Social Protection. Furthermore, they have a signed Memorandum of Understanding with the University of Guyana, thus working quite closely together.

In all IAST supported initiatives, all production guarantees the natural resource base is not exploited and only sustainable practices are used. IAST has committed to equipping their facilities with solar energy capabilities to the extent possible. Furthermore, IAST houses an Indigenous Materials Department, which *“guarantees any building material is of durable, functional materials from cheap, renewable sources, waste-recycled materials, waste biomass and clays. They work significantly with composites made of recycled plastics and agricultural and wood fibers, as well as with recycled rubber from used tires amalgamated with asphalt”*.¹⁰⁹

Corporate Social Responsibility (CSR) is a value and a practice of all business initiatives. Through their CSR efforts, they make an effort to engage international corporations, such as Exxon. Such a partnership opens up IAST to potential funding through Exxon’s CSR programming, as well strengthens the relationship between Exxon and the indigenous communities, which is essential at this point in time with the recent discovery of oil. The hope is facilitating such a partnership will work towards guaranteeing mining moves forward in a manner that supports community growth both socially and economically.

All IAST initiatives have a training component, which is either carried-out within the communities or at the IAST campus. IAST host state-of-the-art labs that are used for training purposes. In order to support a sustainable training programme, IAST provides a Training of Trainers programme for the Board of Industrial Training, as well as to community members.

The following is an illustrative example of one IAST supported enterprise that demonstrates how government and private sector are coming together to support the skill building necessary to grow Guyana’s green economy.

The Rupununi Essence Enterprise¹¹⁰ is working with Region 9 in the Rupununi and partnering with the Macushi Research Unit (MRU) and the Medicines from Trees (MFT) organization. IAST’s work with the indigenous population builds on the foundation that already exists in the communities. Their approach believes in working through co-operatives, which indigenous communities have been utilizing traditionally for years; therefore, this is a natural application of a traditional practice to a new business model. Professor Suresh Narine, Director of IAST, sums up this approach in one phrase, *“marrying indigenous knowledge with modern application”*.

Rupununi Essence is a line of cosmetic facial cleansers produced using coconut oil, essential oils of lemongrass, and crabwood oil from the Guyana rainforest. The Crabwood tree is a member of the mahogany family, thus logging

¹⁰⁸ iast.gov.gy/.

¹⁰⁹ http://iast.gov.gy/?page_id=108

¹¹⁰ www.rupununiessence.gy/.

Skills for Green Jobs in Guyana

of this species was a common practice for its commercial value. Being able to use the pods of the tree for this new business enterprise has worked towards decreasing logging incentives; thus, supporting conservation of critical ecosystem flora. Another core ingredient in Rupununi Essence is lemon grass. IAST partners with the Ministry of Social Protection to work with a vulnerable community in Buxtom. Working through the co-operative model, the business enterprise works with single mothers to grow the lemongrass in their backyards.

The products are being developed to be in compliance with the American Society of the International Association for Testing and Materials (ASTM) for facial soaps. In order to support viable business enterprise development that is sustainable, IAST's business model targets high-end markets, thus focusing on international standards for packaging and branding. All products produced in IAST sponsored enterprises meet the standards of the International Organization for Standardization (ISO), as to avoid any potential barriers to international markets.

Since Rupununi Essence started in 2016, Professor Suresh stated the initiative has engaged 400 community members and earned \$800 million Guyanese dollars. In order to guarantee empowerment of the indigenous communities, all intellectual property rights for products produced belong to the communities and profits go directly back to them, managed by the Community Council. Profits are utilized for community development, whether health, education or other considerations. Currently, the enterprise is not able to sustain itself independently. Notwithstanding, the foundation is being laid through training and the establishment of a processing plant that will allow this enterprise to become self-sufficient.

IAST provides a full training programme for community members supporting the enterprise development. The training includes: procurement, accounting, safety, quality control, marketing (social media), product development, business management, setting internal controls, branding, packaging, and science/chemistry.

Additionally, soft skill development is considered essential therefore, in all training there is focus on leadership, building trust and community engagement.

The project has a special focus on youth. Currently, there are eight youth trainees from the region going through a six-month training programme at the IAST campus in Georgetown. Recruitment of the trainees was done through IAST reviewing their Caribbean Secondary Examination Certificate scores and asking the Community Council for recommendations. Students were then asked if they wanted to join the programme.

A discussion with the eight trainees demonstrated what a valuable opportunity this is for the youth of the Rupununi region. When asked what they would be doing if not participating in this programme, they responded, "not sure". They went on to explain how opportunities for youth from the region are limited both in higher education and employment. They said maybe they would go into mining, even though this would not be their ultimate career choice. They felt the skills they were learning at IAST were both empowering them and their communities.

5.8 Conservation international – Rupununi innovation fund

This Case Study looks at Conservation International's¹¹¹ implementation of the Rupununi Innovation Fund. The Fund was designed to support Guyana's LCDS through piloting climate resilient and sustainable business models in the sectors of tourism and agriculture.¹¹² More specifically, it is providing loans for small-scale development projects focusing on sustainable management of forests, savannahs and other ecosystems; agro-tourism; and crafts. Key

¹¹¹ Conservation International is a US-based NGO working in Guyana. www.conservation.org/projects/Pages/supportinglow-carbon-livelihoods-in-guyana.aspx.

¹¹² www.stabroeknews.com/2014/news/stories/07/24/60m-fund-launched-push-green-agriculture-tourism-rupununi/

partnerships among international organizations, the Guyanese government and banking institutions are shown to be invaluable. This initiative demonstrates how the approach of merging traditional knowledge and practices with new skills and knowledge, is working to effectively scale-up economic activities.

The Rupununi, located in southern Guyana bordering Brazil, contains a variety of ecosystems: savannah, forest and wetlands. It is a high biodiversity region, providing habitats to over 9,000 species of flora and fauna.¹¹³ Included in this are also some of the world's most endangered species, such as jaguars, giant river otters, black caiman, giant anteaters, giant river turtles, giant pimelodid catfish, and arapaima. The region is home to Guyana's indigenous population, whose presence dates back 7,000 years. Today, the region hosts approximately 24,000 persons living within 60 villages.¹¹⁴ The indigenous population includes a mix of ethnic groups: Makushi, Wapisiana, and Arawak.¹¹⁵ The indigenous population of Guyana represents 10.5 per cent of the total, with others being of Indian, African, Chinese, Portuguese, and European origin.¹¹⁶ The region faces many challenges ranging from land use and tenure issues; unsustainable agriculture, fishing and mining practices, such as gold mining dredging; and impacts from climate change that are disrupting weather patterns. Furthermore, education levels are low, which can limit economic growth activities. Data from the Rupununi Economic and Environmental Baseline Report shows very low education levels for the region. Heads of Households did show close to 100 per cent for completion of primary school, but only 23 per cent for secondary school and one per cent at university level. All these present a threat to the biodiversity and livelihoods of the communities residing there.¹¹⁷

113 www.globalwildlife.org/our-work/regions/south-america/exploring-the-biodiversity-of-the-rupununi-savannah/

114 Elliot, Jorge, Paredes, Willy and Montero, Robert. The Rupununi Economic and Baseline Report. Organizations represented are: Conservation International and Practical Action-Latin America.

115 <https://rupununi.org/>

116 www.cia.gov/library/publications/the-world-factbook/geos/gy.html

117 Conservation International Impact Report 2016.

Conservation International initiated the Rupununi Innovation Fund (hereafter referred to as the Fund) as a means to address some of the vulnerabilities of the region. The Fund was launched in 2014, with GBTI investing 60 million Guyanese dollars as seed capital, with the understanding that the Government of Guyana would waive any corporate tax requirement on income earned through loans granted during the life of the project. Additionally, Conservation International is the co-financer and executor of US\$ 1.6 million from Inter-American Development Bank Multilateral Investment Fund.

The approach being taken by Conservation International is a participatory, community-based one that values and incorporates traditional knowledge and practices into the project's implementation. Furthermore, it is an evidence-based approach, where data will be collected and analyzed to inform national policy and future initiatives. As of July 2017, the Fund has engaged 109 community members spread out across the Rupununi region, as show in Table 14. A total of 23 community-based enterprises are being supported through this Fund.¹¹⁸

Table 13. Geographic spread of beneficiaries in the Rupununi Sub-region

RUPUNUNI SUB-REGION	# OF BENEFICIARIES
South Pakaraimas	5
North Rupununi	25
Central Rupununi	48
South Central Rupununi	8
South Rupununi	23

Training for all enterprise development initiatives is carried out by Conservation International experts, as well as from NAREI and GBTI, providing agriculture and banking technical support respectively.¹¹⁹

118 www.conservation.org/projects/Pages/supporting-low-carbon-livelihoods-in-guyana.aspx.

119 www.stabroeknews.com/2014/news/stories/07/24/60m-fund-launched-push-green-agriculture-tourism-rupununi/.

Skills for Green Jobs in Guyana

All training incorporates local knowledge and skills in the areas of agriculture, ecology and tourism. Illustrative courses taught are:

- Food handling and storage;
- Value chain links to market;
- Business management;
- Financial management;
- Leadership;
- Customer relationship management;
- Machine/equipment maintenance;
- Good manufacturing practices;
- Record keeping;
- Procurement processes.

A manual on all training modules is being compiled, which will be made public once completed.

The Fund supports two initiatives that focus on female entrepreneurship. These are:

- a) Moco Moco: Alleviation of the Negative Effects of Natural Disasters in Region 9 Indigenous Communities by Improving Cassava and Farine Production for Food Security;
- b) Wowetta: Empowering Women in Wowetta to Mitigate Threats to Food Security Resulting from Drought, Flooding, Wildfire and Extreme Climate Change Effects.

All female participants are between the ages of 18 and 60. There are 35 participants in Moco Moco and 50 in Wowetta. A cooperative was formed in Moco Moco that includes both males and females, but predominantly led by the females. In Wowetta there was already a functioning female cooperative that took ownership of this project. The projects have been ongoing for the past three years, coming to completion in December 2017. At this time, the factories will be fully operational and independently managed by the female participants and cooperatives.

The aim of the project in Moco Moco was to apply new processing techniques so that cassava will have a shelf life up to seven months, thus increasing its market value. Traditionally, women in the region farm farine therefore, this was a natural application. In addition to agro-processing, other areas in which women engage predominantly are fishing and tourism. The Fund has also supported the establishment of 12 eco-lodges for which the women are actively engaged in both management and support roles.

This project works to increase financial independence of women in the community. There are a significant number of female-headed households in the region, as shown in the Rupununi Economic and Environmental Baseline Report.¹²⁰ Table 14 presents an extract of these figures.

Table 14. Breakdown of women-headed households in the Rupununi sub-region

DISTRICT IN RUPUNUNI	% OF WOMEN-HEADED HOUSEHOLDS
South Pakaraimas	23
North Rupununi	38
Central Rupununi	35
South Central Rupununi	30
South Rupununi	8

With that said, data also shows that males in the region control 75 per cent of the income. There are regional differences where in the southern and central districts, women have shown to control up to 40 per cent of the income. Overall, females still show less financial independence; therefore, this project is noteworthy in supporting female entrepreneurship.

¹²⁰ www.conservation.org.gy/publications/Economic_Baseline_report.pdf.

6. Conclusions and recommendations

It was reported earlier that Guyana is now laying the foundation for its transition to a greened economy and state. Current and projected hydrologic impacts on the country's already fragile economy necessitates urgent and decisive action to mitigate emerging socio-economic and environmental vulnerabilities and risks, especially citizens' ability to engage in effective livelihood strategies. Section 2 points to the dependence of the labour market and the economy on a handful of extractive, natural resource based commodities and public-sector consumption which are unsustainable and contrary to improving socio-economic resiliency through mitigation and adaptive measures. In the medium term, it is noted that Guyana's economy is expected to grow modestly, averaging 3.71 per cent estimated annual growth.¹²¹ This figure excludes anticipated petroleum investments and initial dividends; thus, the economy will continue to rely on the employment, export earnings and domestic investment flow from its traditional sectors in the short to medium terms as it transitions to a greener economy. The demand for green skills and greened occupations is expected to increase in the energy and agriculture sectors, though to a lesser extent in the latter. Likewise, an increase is expected in Guyana's climate change mitigation services. Though these expectations are based on current trends in public and private sector investments, Guyana has not yet quantified measurable skills and green jobs baselines or projections.

The ILO's policy brief, *Greening the Global Economy, The Skills Challenge*, notes that "green jobs skills development is not only reactive but can be an important driver of change itself. Promoting skills for green jobs fosters investments in green activities and accelerates the green transformation..."¹²² While Guyana's GSDS Framework and the CRSAP both outline probable human capacity and institutional skills

requirements, these projections are centred on anticipated outcomes of greening the economy based either on current or future planning and/or programme needs. The absence of green growth labour market baselines, nationally or sectorally, mitigates coherency between planned greening actions on the one hand and skills requirements differentiated by sector and industry on the other. This challenge is indicative of the LIMS deficiencies referenced in subsection 4.1 and insufficient systematization of policy inputs connecting environmental sustainability, green growth skills, labour demand and labour market challenges related to restructuring the economy. For example, gender roles create differentiated vulnerabilities in communities and the labour force according to the division of labour. Whereas the general impacts of climate change, greening and restructuring on Guyana's economy are duly noted, green growth labour policies guided by universal good practices on data inputs and analysis would help to reveal specific risks, vulnerabilities, skills requirements and labour market barriers and/or opportunities disaggregated by identity factors,¹²³ such as sex, age, ethnicity, disability, and so on, among other indicators.

Proposed policy recommendations

Overall, increasing awareness of the above-mentioned connections will encourage independent and collaborative research on the labour market restructuring implications of these connections. Increased awareness has a net triple effect: (i) increased awareness will further stimulate the attention of training institutions, employers and policymakers to the critical role of skills development in greening and restructuring the economy, (ii) awareness leading to greater attention and research will reduce labour market data gaps in planning and policy formulation

121 See section 2, for Guyana's annual GDP projections by the IMF.

122 The ILO's policy brief, *Greening the Global Economy, The Skills Challenges*. (2011). Pg. 1.

123 Identity Factors refer to attributes of an individual or community such as one's sex, age, socio-economic status, education, literacy, ethnicity, disability, religion and so forth. Some of these identity factors can be the reason for a person and/or community being in a position of vulnerability and marginalization. It is critical to note that none of these identity factors are in a silo. There is intersectionality among all of them and not one identity factor fully represents an individual and/or community.

Table 15. Recommended good practices and priority policy messages

GOOD PRACTICE	IMPROVE POLICY COORDINATION AT PLANNING, DESIGN AND IMPLEMENTATION STAGES
Challenges	(i) Minimal awareness of the intersections between environmental sustainability, green growth skills, labour demand and labour market challenges related to restructuring the economy and (ii) labour and skills mechanisms insufficiently integrated in national institutional set-up steering GSDS process.
Policy gap	(i) Lack of coherency between skills needs policy objectives and its integration into policy framework and (ii) restructuring and greening implications on current labour market policy.
Proposed action	(a) Strengthen representation of labour response issues and mechanisms at multiple levels of GSDS policy formulation.
Justification	(i) Improved integration and planning of sector and/or industry specific skills for green jobs requirements in GSDS policy.
Gender equality and social inclusion	As policy development becomes more coordinated addressing named gaps, it is critical all policies be developed through a GESI lens.
GOOD PRACTICE	IMPROVE SYSTEMS FOR IDENTIFYING AND ANTICIPATING SKILL NEEDS
Challenges	(i) Sector level labour response strategies absent in policy framework due to lack of systematized, evidenced-based labour and skills data in policy framework.
Policy gap	Existing policy framework on green growth illustrates general skills needs considerations are lacking in policy strategies.
Proposed action	(a) Consolidate institutional and human capacity skills needs from the CRSAP with available labour force data and emerging lessons learned to establish an initial baseline and (b) Analyse illustrative skills needs outlined in GSDS framework against baseline to incorporate evidence-based labour and skills requirements strategies in GSDS (not just needs or generic skills requirements); (c) Undertake sector and theme-based labour and skills needs assessments – human and institutional capacity – in the 15 CRSAP sectors organized based on the 7 central GSDS theme; (d) initiate policy actions to reconfigure national labour force intelligence structure and review/update existing labour market policy.
Justification	(i) The GSDS policy incorporates evidence-based inputs using baseline analysis comprised of LFS survey data, consolidated CRSAP sector level skills needs and skills needs priorities outlined in central themes to inform sector-level green growth skills requirements needs assessments and labour marketing planning and support systems e.g. ALMPs and training and (re)training measures and green growth labour incentives; (ii) fully operationalize and add skills and jobs for green growth indicators in LMIS tool and periodic labour market data collection and (iii) integrate labour and skills (green and otherwise) indicators in all private sector statistical entities and build human, technological and institutional capacity for time series labour market data collection and analysis.
Gender equality and social inclusion	To the extent possible, when consolidating existing data for an initial baseline, guarantee a collection of as much disaggregated data by identity factors as possible. Likewise, when undertaking new sector and theme-based labour and skills needs assessments, it is essential that data collection tools and methodology be designed in a manner that considers GESI. In light of identity factors of an individual or community, there are significant differences with skill needs and skill development; therefore, this data must be captured to truly have an evidence-based labour and skills data policy framework.

GOOD PRACTICE FOCUS ON RETRAINING AND THE DEVELOPMENT OF PORTABLE SKILLS TO ENCOURAGE OCCUPATIONAL MOBILITY	
Challenges	(i) Adequacy of green growth jobs to retain workers, reduce skills emigration and increase employment.
Policy gap	Supply-side skills retainment requirements considering economic restructuring and greening.
Proposed action	(a) Research and incorporate supply-side needs beyond skills training requirements.
Justification	(i) Labour market volatility and reduced skills shortages (qualitative and quantitative) are better mitigated when green growth moderates cost of living, improves liveable wages, strengthens livelihood capabilities and encourages upward mobility within and across sectors.
Gender equality and social inclusion	It is critical that individuals and groups that have been marginalized historically in the labour market do not continue to be marginalized as the economy shifts green. Identity factors must be considered when designing and delivering retraining/training programmes, making needed accommodations where necessary.
GOOD PRACTICE TARGET SKILLS NEEDS THROUGH SOCIAL DIALOGUE	
Challenges	(i) Stimulating multi-sector public dialogue outside and beyond of formal GSDS process.
Policy gap	Strategies and tactics to encourage recurring, high level as well as accessible dialogue outside and beyond the GSDS elaboration process.
Proposed action	(a) Design policy foundation to establish collaborative, industry specific and/or thematic/issue based skills councils, policy contributing think tanks, the adoption of green skills and employment focus by employers' and employees' associations, public dialogue events and recognition of good practices and achievements, green growth and skills training/(re)training.
Justification	(i) Transitioning and sustaining an inclusive green economy and cohesive green state requires adequate labour force production and citizen-engagement to continuously shape the greened economy and state during and subsequent to the GSDS green paper.
Gender equality and social inclusion	All citizens, regardless of identity factors, must have an equitable opportunity to participate in social dialogue. Historically, persons have been marginalized in this process, yet each face very unique challenges in the labour market and in accessing education and training. In order to increase inclusiveness, public dialogue planning will need to consider location, timing, language level and type used, among other critical factors.
GOOD PRACTICE PRIORITIZE TRAINING FOR DISADVANTAGED GROUPS	
Challenges	(i) Policy objectives and outcomes in response to lost productivity and economic output based on labour market participation barriers experienced by priority vulnerable groups.
Policy gap	Connecting inclusion of priority vulnerable groups to productivity and economic growth.
Proposed action	(a) Outline policy proposals and approaches that link inclusion of vulnerable groups and sector-level skills for green growth and productivity based on competitive advantages, moving beyond socio-economic vulnerabilities framing of inclusion.
Justification	(i) Policy and planning measures that frame reduced barriers to the economic inclusion of vulnerable groups (e.g. youth and persons living with disabilities) to increased economic productivity and green growth are better aligned to GSDS and economic restructuring objectives that seek to maximize productivity and consumption.
Gender equality and social inclusion	It is critical that when considering vulnerable populations that this is done in a manner that considers the full range of identity factors remembering that no one group is homogenous. For example, when programming for youth, it must be remembered that there is much variation within this category, i.e. male and female youth, youth with disabilities, youth belonging to indigenous populations, youth living in remote rural region versus urban and so forth.

and (iii) better informed policies and planning produces more effective ALMP's and other labour volatility mitigating measures.

The proposed recommendations below link to one of six priority policy messages produced from a joint research of policies, case studies and emerging good practices undertaken by International Trade Union Confederation, International Organisation of Employers, European Centre for the Development of Vocational Training, European Union, ILO and UNEP. Furthermore, they are reported against the challenges, policy gaps and emerging skills development experiences at the sector-level in Guyana. For purposes of this study, a point has been added within each good practice that speaks to consideration of gender equality and social inclusion (GESI). This is in line with Guyana's GSDS Framework, which states in the country's commitment to green economic growth, priority is placed on inclusive development. It speaks to "access to quality education and training facilities" as a strategic area focus, as well as to prioritizing "human development and well-being" as a central theme. The GSDS Framework holds up a Do-No-Harm Approach, that is one that entails, "participatory and inclusive processes and social cohesion principles, that will require both improvements to and a reduced reliance on traditional sectors, which act as the key drivers of this economic transformation whose ultimate goal is to address and redress all types of inequalities in Guyana and promote a peaceful and resilient society".¹²⁴

The foregoing recommendations are not exhaustive, they react to key gaps in the existing policy framework, associated challenges and share the collective objective of reducing gaps between skills (both generic and technical) needs and corresponding strategies. The recommendations based on emerging skills response strategies in Guyana cut across sectors, programmes and policies:

Scale up The Guyana REDD+ fund as a skills catalyst for Guyana's green programme

Sustaining access to forest carbon markets and exploring other ecosystems services market opportunities like watersheds and biodiversity, are core green policy and investment priorities for the Government. Essentially the GRIF functions as an investment and payment for Guyana's climate change mitigation services and green, decarbonized economic development respectively. In this regard, the GSDS Framework duly notes, "A critical element of the Green State Development Strategy is the sustainable management of natural resources and expansion of environmental services, especially when envisioning economic development and expansion to new productive sectors".¹²⁵ From its inception, the GRIF has realized the following investments (see Table 16).

Even as some of these investments prioritized infrastructure improvements, economic participation and job creation, each share

Table 16. GRIF Investment to date - (in US\$ millions)

PROJECT	GRIF INVESTMENT MINUS (NET ADMINISTRATIVE AND OPERATIONAL EXPENSES)
Institutional Strengthening project	5.94
Micro and Small Enterprise Development project	5.00
Amerindian Development Fund – Village Economy	7.96
Amerindian Land Titling	6.26
Cuhna Canal Rehabilitation project	3.00

¹²⁴ Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017.

¹²⁵ Guyana's Office of the Presidency and the United National Environment Programme. Framework of the Guyana Green State Development Strategy and Financing Mechanisms. 28 March 2017. Pg. 14.

Skills for Green Jobs in Guyana

characteristics of skills training and/or institutional capacity strengthening. Despite this utilisation, the GRIF's impact on developing skills for green jobs in Guyana has not been assessed. Furthermore, GRIF investments continue to influence Guyana's labour market structure by contributing to increased greening skills in the labour market supply, increased demand for green skills and anticipation of green jobs. This presents an opportunity for Guyana to assess, promote and scale up the Fund's impact on skills for green jobs in future investments and partnerships.

Scaling modalities interlinking access to finance, skills training and innovation

Section 4.4 highlighted the emerging practice of linking skills training for green growth with access to financing. Although this subsection reported on the private sector experiences, there are few approaches referenced that demonstrate public-private collaboration. In the commercial financial sector, excluding public-private partnerships that an institution may be party to, financing for eligible green investments is more restricted when compared to the Government-led MSED programme with 17 eligible sectors. Skills training and access to finance are prioritized for vulnerable groups including those affected by priority restructuring sectors, access to credit, and business management training barriers. Exploring measures to encourage syndicates by forming incentivized networks and programmes that connect local entrepreneurs, or local and foreign investors, can mobilize technology transfer, accelerate value-added ventures, secure markets, foster innovation and boost green skills. Alternatively, financing and skills training to green existing occupations is likely to stimulate more sustainable and transformative greening of the economy since these occupations are presently connected to businesses that already demonstrate viability and potential to increase efficiencies if greened. Moreover, greening existing occupations compared to investing in new green occupations tends to be less expensive and more viable in the long run. The earlier referenced policy brief, *Greening the Global Economy – The Skills Challenge*, alluded to this by reporting, “*There will*

be far more established occupations requiring skills upgrades than brand new occupations. Where new occupations are created, they often call for higher-level qualifications, either because of their dependence on new technologies or because they require sophisticated skills.”¹²⁶

Finally, although Guyana promotes itself as a green investment destination and is taking steps to strengthen increased foreign investment for its priority green growth sectors and industries, the country has not yet established a national Green Investment Prospectus. This activity should be periodically updated and demonstrate varying investment opportunities, socio-economic and environmental objectives aligned to local and international standards, preferred partnership modalities and incentives *inter alia*.

Extend green planning beyond Bartica

The socio-economic planning carried out by the Green Bartica Development Plan, noted in section 4.3, applied circular economic and development modelling which produced a socio-economic plan to green Bartica. As earlier noted, the plan consists of zones for agriculture, recreational, infrastructure works, construction and rehabilitation of settlements, eco-friendly solid waste management and other programmes, all of which are designed to green the town, develop a circular, resource-efficient local economy. The plan also serves as a blueprint for training and (re) training requirements on the basis of the varying anticipated green skills needed to green and develop the sectors of Bartica's local economy. This practice can be replicated in other towns and populous settlements to green and update town and settlement planning based in accordance with their comparative advantages and socio-economic development needs. This not only creates demand for green jobs, it drives green skills demand, green jobs growth and assists training and educational institutions to orient programmes to prepare an adequate labour force.

¹²⁶ The ILO's policy brief, *Greening the Global Economy, The Skills Challenges*. (2011). Pg. 4.

Expand green growth tax incentives to drive both demand and supply-side green growth

Guyana is implementing tax concessions to reduce the importation cost of renewable and energy efficiency technologies to make them more readily accessible locally and orient consumers towards cleaner and less expensive energy sources in the long term. This measure is also supportive of reduced reliance on fossil fuel imports, emissions, the long-term cost of energy sources derived from fossil fuel and demand for related jobs and skills associated with renewable energy. Expanding Guyana's green growth tax concession regime to other capital inputs, business services and activities makes the environmental sustainability and resource efficiency investments more affordable by reducing the immediate costs of greening existing occupations and developing new green businesses in the non-profit and commercial private sectors. Concessions can also be extended to training institutions investing in training and/or (re)training programmes directly linked to priority green sectors and occupations, thus increasing supply side drivers of green growth.

Strengthen TVET Research and Development Capabilities for Green Innovation

It was reported earlier in section 4.2 that Guyana is investing approximately US\$ 15 million in TVET reform to support anticipated skills demand for green jobs. New green occupations, as referenced in our recommendation on scaling financial modalities interlinking skills training for green jobs, are more likely to require higher-level skills. Similarly, innovations are also required to green existing occupations and increase value-added components of value chains across numerous sectors. A critical function of CCESD TVET reform is therefore improving the system's capabilities and resources to innovate not only equipping the labour force with technical skills but also to satisfy anticipated green growth. TVET combined with higher-level expertise can have a major impact on green growth at all levels of business in multiple fields. This report's case study on IAST offers an instructive example.

Linking the institute's mandate and ongoing green pilot research and innovation investments with TVET in the form of joint applied research and innovation facilitates skills and technology transfer while providing practical instruction. This expertise accumulated by both institutions can be applied to internal training, research and innovation pursuits. These higher-level skills can also be employed to commercialize economically and technologically viable ventures and innovations that contribute to new green occupations of greening existing ones.

Final remarks

Although Guyana is not a Small Island Developing State (SIDS), it is often categorised as one due to similar economic characteristics and risks associated with anticipated or current climate change impacts in the country. Its narrow commodity export dependent and extractive industry based economic structure, high food import bill, minimal size of its internal market, susceptible drainage, irrigation and sea defence networks, experiences of high volume of human capital flight and acrimonious political system, which is a key source of inter-group tension in its pluralist make-up, are a few of the country's peculiar vulnerabilities that exacerbate its risks of long-term socio-economic and environmental sustainability. Rightly so, Guyana's NDC emphasizes and links climate adaptation investments and mitigation measures oriented to minimizing hydrologic variability drivers and capitalizing global climate change mitigation services. Guyana's NDC referencing its LCDS estimates total near and long term adaption costs at surpass US\$ 1 billion.

Table 17. Priority climate adaptation measures¹²⁹**ADAPTATION**

Total adaptation costs for Guyana are projected to exceed US\$1 billion at the national level. While all of these adaptation needs must eventually be met, the Office of the President has identified a portfolio of urgent, near-term investments in the highest priority areas where the population and economic activity are concentrated. These are detailed in Section 9, and include:

- Upgrading infrastructure and assets to protect against flooding through urgent, near-term measures (US\$225 million);
- Hinterland Adaptation Measures (US\$10 million);
- Addressing systematic and behavioural concerns (US\$33 million);
- Developing innovative financial risk management and insurance measures to resiliency (US\$10 million);
- Switching to flood-resistant crops (US\$10 million).

In addition to these urgent near-term measures, an additional US\$500 million to US\$600 million of long-term adaptation measures have been identified, including:

- Upgrading the Conservancy to recognized engineered standards (US\$410 million).

¹²⁷ Guyana Second National Determined Contributions to UNFCCC. (2015). Pg. 385. See also Guyana's LCDS (2013) pg. 31.

7. References

- ASL Terminology. N.p., n.d. Web. 18 July 2017. <http://www.lifeprint.com/asl101/pages-layout/terminology.htm>.
- A World Bank Group Flagship Report. Doing Business 2017. Equal Opportunity for All Economy Profile, Guyana. International Bank for Reconstruction and Development / The World Bank, 2017.
- Bynoe, Paulette Dr Chapter 4: The Political Economy of Transitioning to a Green Economy in Guyana. In *Transitioning to a Green Economy: Political Economy of Approaches in Small States* (pg 77-106). Editors: Nadine; Halton, Anna, Strachan, Janet. Commonwealth Secretariat, 2014. Retrieved on 27 June 2017 at: www.keepeek.com/Digital-Asset-Management/oecd/commonwealth/economics/transitioning-to-a-green-economy/the-political-economy-of-transitioning-to-a-green-economy-in-guyana_9781848599178-6-en#.WS2YyuvvDc#page1
- Caruso, Luiz Antonio Cruz. *Skills for Green Jobs in Brazil*. ILO, 2010.
- CDB *Announces Support for a Climate-smart Agricultural Sector in Guyana*. Caribbean Development Bank, 21 July 2017. Web. 25 July 2017. <http://www.caribank.org/news/cdb-announces-support-climate-smart-agricultural-sector-guyana>.
- Constitution of the Co-operative Republic of Guyana Act, 1980. <http://parliament.gov.gy/constitution/>
- Disaster Risk Management Plan for the Agriculture Sector, 2013-2018 for the Cooperative Republic of Guyana. Ministry of Agriculture, Civil Defence Commission, and UN Food and Agriculture Organization. April 2013.
- ECLAC: *Guyana Macro-Socio-Economic Assessment of the Damage and Losses Caused by the January-February 2005 Flooding*. 2005
- Elias, Carlos. *Private Sector Assessment of Guyana*. Inter-American Development Bank. 2014.
- Elliot, Jorge, Paredes, Willy and Montero, Robert. *The Rupununi Economic and Environmental Baseline Report*. Organizations represented are: Conservation International and Practical Action-Latin America. *Exploring the Biodiversity of the Rupununi Savannah*. Global Wildlife Conservation, n.d. Web. 19 July 2017. www.globalwildlife.org/our-work/regions/south-america/exploring-the-biodiversity-of-the-rupununi-savannah/
- Frederic Docquiera, B. Lindsay Lowell and Abdeslam Marfouk. *A Gendered Assessment of Highly Skilled Emigration*. December 2008.
- Government of Guyana. *Guyana's Revised Intended Nationally Determined Contribution*. UNFCCC, 2015, www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx. Accessed 30JUN17.
- Guyana. *Apiculture and the Honey Mangrove*. Guyana Chronicle, n.d. Web. 18 July 2017. <http://guyanachronicle.com/2010/10/23/apiculture-and-the-honey-mangrove>.
- Guyana. Bureau of Statistics. *2012 Guyana Population and Housing Census*. N.p.: n.p., 2012. Print.
- Guyana. Conservation International. *Impact Report 2016*. Georgetown: Conservation International, 2016. Print
- Guyana. *Guyana's Sovereign Wealth Fund for Public Consultation*. By Tiffny Rhodius.
- Ministry of Natural Resources, 29 Mar. 2017. Web. 19 July 2017. <http://gina.gov.gy/guyanas-sovereign-wealth-fund-for-public-consultation/>.
- Guyana. *Institute Of Applied Science And Technology Solutions for Sustainable Growth through Science and Technology*. IAST, n.d. Web. 22 July 2017. http://iast.gov.gy/?page_id=108.
- Guyana. Ministry of Agriculture. *A National Strategy for Agriculture in Guyana, 2013-2020: Agriculture - Our Vehicle for sustained Economic and Social Prosperity: Vision 2020*. Guyana. Ministry of Agriculture. 2013.
- Guyana. Ministry of Agriculture. National Agricultural Research and Extension Institute (NAREI). *Guyana Climate Smart Agricultural Manual*. By Oudo Homenauth. N.p.: n.p., 2015. Print.

- Guyana. Ministry of Agriculture. National Agricultural Research Institute. *National Mangrove Management Action Plan 2010-2012*. N.p.: n.p., 2010. Print.
- Guyana. Ministry of Education. Guyana Education for Sustainable Development Policy. N.p.: n.p., 2015. Print.
- Guyana. Ministry of Finance. *Guyana Poverty Reduction Strategy Paper 2011-2015*. N.p.: n.p., 2011. Print.
- Guyana. *NAREI Pushing Hydroponics Farming*. Ministry of Agriculture, 21 Nov. 2016. Web. 22 July 2017. <http://agriculture.gov.gy/2016/11/21/narei-pushing-hydroponics-farming/>.
- Guyana. Office of the Presidency and the United National Environment Programme. Framework of the Guyana. Green State Development Strategy and Financing Mechanisms. 28 March 2017.
- Guyana. Parliament of the Co-operative of Guyana. *Forest Act 2009 (Act #6 of 209)*. N.p.: Guyana's National Printers Limited, 2009. Print.
- Guyana's 2012 Population Census: Runaway Brain Drain Rules. Thomas, 2014. Web 25 July 2017. www.stabroeknews.com/2014/features/08/10/guyanas-2012-population-census-runaway-brain-drain-rules
- Guyana. *Shadehouse Project Launched*. Guyana Chronicle, 17 Mar. 2014. Web. 18 July 2017. <https://guyanachronicle.com/2014/03/17/shadehouse-project-launched>
- Guyana. *Shade House Farming Project to Build Entrepreneurial Skills among Disabled Students*. INews Guyana, 16 Oct. 2014. Web. 21 July 2017. www.inewsguyana.com/shade-house-farming-project-to-build-entrepreneurial-skills-among-disabled-students.
- Guyana. *\$60M Fund Launched to Push Green Agriculture, Tourism in Rupununi*. Stabroek News, 24 July 2014. Web. 22 July 2017. www.stabroeknews.com/2014/news/stories/07/24/60m-fund-launched-push-green-agriculture-tourism-rupununi.
- Guyana. *Success Stories Hydroponics Vegetable Production in Guyana*. N.p., n.d. Web. 18 July 2017. <http://argus.iica.ac.cr/Eng/regiones/caribe/guyana/IICA%20Office%20Documents/Success%20Stories%20-%20Hydroponics.pdf>
- Guyana. *The Holdgate Report on Climate Change*. Guyana Chronicle, 15 Oct. 2016. Web. 15 July 2017. <https://guyanachronicle.com/2016/10/15/the-holdgate-report-on-climate-change>
- Guyana. *The North Rupununi Wetlands*. By Graham Watkins. N.p., n.d. Web. 20 July 2017. <https://rupununi.org/>
- Hinds, Samuel A. "Government of Guyana Strategy for Underserved Areas Electrification Programme." 2001. Impacts of Climate Change on Guyana and the World at Large. Part 1. Pg. 3. Available at: www.lcids.gov.gy/index.php/documents/climate-change-information/understanding-climate-change/15-understanding-climate-change-part-2-impacts-of-climate-change-on-guyana-and-the-world-at-large-part-1-observed-climate-change/file
- Integrated Solid Waste Management Plan. Ministry of Communities. 2017.
- Inter-American Development Bank. Project Appraisal Document. Micro and Small Enterprise (MSE) Development and Building Alternative Livelihoods for Vulnerable Groups. 2013.
- Inter-American Development Fund. IDB Approves Climate-smart Agriculture Fund. Inter-American Development Bank, 16 July 2016. Web. 18 July 2017. www.iadb.org/en/news/news-releases/2015-07-16/climate-smart-agriculture-fund,11207.html
- Kreditanstalt für Wiederaufbau (KfW) with support from Conservation International-Guyana. The Extractive Industry in Guyana: a trigger for sustainable development. KfW, 2014.
- Majumdar, Shyamal. Developing a Greening TVET Framework. UNESCO-UNEVOC International Centre, 2012.
- Mass, William; Moss, Philip; Hopkins, Matthew; and Ross, Matthew. Skills for Green Jobs in United States. ILO, 2010.
- Mondal, Abdul Hye; Iqbal, Zabid; Mehedi, Shaifullah. Skills for Green Jobs in Bangladesh. ILO, 2010. Office of the President of the Republic of Guyana. A Low Carbon Development Strategy (LCDS): Transforming Guyana's Economy While Combating Climate Change. May 2010.

Skills for Green Jobs in Guyana

- Project Appraisal Document on a Proposed Credit in the Amount of SDR 6.2 Million (US\$10 Million Equivalent) to the Co-operative Republic of Guyana for the University of Guyana Science and Technology Support Project. May 23, 2011. World Bank/Caribbean Country Management Unit.
- Rafferty, Mike; Yu, Serena. Skills for Green Jobs in Australia. ILO, 2010.
- Second National Communication to the United Nations Framework Convention on Climate Change. Government of Guyana 2012.
- Singh, Joseph. Sustainable Livelihood and Entrepreneurial Development Initiative (SLED). Development of Local Area Economic and LED Strategic Plans-Bartica Township. Local Economic Development (LED) Strategic Plan. Guyana.
- Singh, Joseph. Sustainable Livelihood and Entrepreneurial Development Initiative (SLED). Development of Local Area Economic and LED Strategic Plans-Bartica Township. Local Area Economic Profile (LEAP). Guyana.
- State Paper on the Future of the Sugar Industry presented to the National Assembly by Guyana's Minister of Agriculture. 2017.
- Sustainable Development Goals*. United Nations Development Programme (UNDP), n.d. Web. 14 July 2017. www.undp.org/content/undp/en/home/sustainable-development-goals.html
- Switzerland. International Labour Organization (ILO). *Skills for Employment: Policy Brief. Greening the Global Economy, The Skills Challenges*. N.p.: n.p., 2011. Print.
- Switzerland. International Labour Organization (ILO). *Social Dialogue: Finding a Common Voice*. N.p.: n.p., n.d. Print.
- UNEP, 2011, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*, www.unep.org/greeneconomy
- USA. CIA: World Fact Book-Guyana. Central Intelligence Agency (CIA), 2017. Web. 11 July 2017. www.cia.gov/library/publications/resources/the-world-factbook/geos/gy.html
- USA. International Monetary Fund (IMF). Western Hemisphere. *Guyana: 2017 Article IV Consultation*. N.p.: IMF Publication Services, 2017. Print. 17/175.
- USA. Agriculture Development and Food Security in Developing Nations. By Wayne G. Ganpat, Ronald Dryer, and Wendy-Ann P. Isaac. N.p.: IGI Global, 2017. Print.
- USA. United Nations Development Programme. Human Development Report 2016: *Human Development for Everyone*. By Jahan Selim. N.p.: Lowe-Martin Group, 2016. Print.

8. List of key resources

In total, 116 persons were interviewed for the purpose of this study. In order to respect the privacy of those interviewed, names have been omitted and instead the names of institutions have been cited.

Government Entities (47 persons)

- Civil Defence Commission Department of Labour;
- Guyana Energy Agency;
- Guyana Forestry Commission;
- Guyana Lands & Surveys Commission;
- Guyana Office for Investment (Go-Invest);
- Guyana REDD + Investment Fund, Project Management Office;
- Guyana Tourism Authority;
- Ministry of Agriculture;
- Ministry of Business;
- Ministry of Communities;
- Ministry of Education;
- Ministry of Foreign Affairs;
- Ministry of Indigenous Peoples' Affairs;
- Ministry of Natural Resources;
- Ministry of Social Protection;
- Ministry of the Presidency;
- Ministry of the Presidency -Department of Environment National Agricultural Research & Extension Institute (NAREI);
- National Center for Educational Resource Development (NCERD) Office of Mayor and Town Council, Bartica;
- Small Business Bureau.

Private Sector Organizations (16 persons)

- Demerara Bank Ltd.;
- Earth Charter Commission;
- Institute of Private Enterprise Development (IPED)
- Karanambu Lodge/Visit Rupununi;

- L. Blyden & Sons;
- NPI Communications;
- Old Fort Tours;
- Phoenix Enterprise, Guyana;
- Qualfon Guyana Inc. Roraima Airways;
- Surveying & Project Management Inc.;
- Wilderness Explorers.

Trade Union, Associations And Non-Governmental Organizations (10 persons)

- Caribbean Youth Environment Network (CYEN);
- Deaf Association of Guyana;
- Guyana RainBow Foundation (GUYBOW);
- Guyana Trades Union Congress;
- Society Against Sexual Orientation Discrimination (SASOD) - SWAG;
- Tourism & Hospitality Association of Guyana (THAG).

International Organizations (10 persons)

- Caribbean Community (CARICOM) Secretariat;
- Conservation International;
- Global Environment Facility (GEF);
- Inter-American Development Bank (IDB) United Nations Development Programme World Bank, Washington DC;
- World Bank/University of Guyana (UG).

ACADEMIC INSTITUTIONS (33 persons)

- Council for Technical & Vocational Education & Training (TVET);
- Cyril Potter College of Education (CPCE);
- Government Technical Institute (GTI);
- Institute of Applied Science and Technology (IAST) University of Guyana;
- University of Guyana (School of Earth and Environmental Science).

List of other environmental legislation

- Environmental Protection Act, 1996;
- Fisheries Management Plan, 2006;
- Guyana's National Biodiversity Strategy and Action Plan, 2012-2020;
- Guyana's National Land Use Plan, 2013;
- Guyana's National Policy on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, 2008;
- Integrated Coastal Zone Management Plan, 2000;
- National Action Plan to Combat Land Degradation, 2008-2018;
- National Biosafety Framework for Guyana, 2007;
- National Environmental Action Plan, 1994;
- National Forestry Action Plan, 1989;
- National Protection Area Strategy, 2003;
- The Mining Act, 1989.

9. Annex

GEA engagement in awareness / capacity-building initiatives

Although training is not explicitly stated in GEA's mandate, the Agency has been involved or collaborated in various awareness and capacity-building initiatives, at the local, national, regional and international levels.

YEAR	INITIATIVES	FACILITATOR	TARGETED AUDIENCE
2017	Strategies and Low Budget Alternative Technologies for Energy Efficiency	Latin American Energy Organization (OLADE)	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Gender and Energy Indicators	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Development of Green Economy Indicators	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Prospective and Energy Planning: Concepts, Tools and General Framework	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Energy Audit Training	OLADE	Selected Government Organizations and representatives of Guyana Manufacturing Services Association, Guyana Sugar Corporation, Linden Utility and University of Guyana
	Econometrics for Renewable Energy Planning	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Renewable Energy and Energy Efficiency Seminar for Government Entities	Guyana Energy Agency (GEA)	Selected Government Organizations
	Electric Tariff Modelling	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	National Grid Code	GPL	Selected Government Organizations involved in the Energy Sector
	Green Baseline Tool (BAT) Assessment	PAHO/WHO	Government Organizations
	Workshop on Investment-Grade Calculation, Analysis and Financial Modelling for Sustainable Energy Investments	CARICOM/GIZ/ UNDP	Organizations responsible for energy in Member States
	Green Climate Fund Training	Ministry of the Presidency, CCCCC	Government Organizations
	Resident Engineer under JICA Senior Volunteer Programme to assist local engineers on solar energy projects	Japan International Cooperation Agency	GEA and GPL

YEAR	INITIATIVES	FACILITATOR	TARGETED AUDIENCE
2017	Renewable Energy Technologies	Government of China	GEA staff (1 Engineer)
	Strategy of low Carbon Economic Development for Developing Countries	Government of China	GEA staff (1 Engineer)
	Solar PV Training Workshop	GEA	Government Electrical Inspectorate
	Regional Energy Efficiency Building Codes	CARICOM/CROSQ	GEA and GNBS
	Resident Hydropower Expert (2016–2017) to assist local engineers with the development of hydropower sites	GIZ/REETA and GEA	GEA and HECl
	Energy Awareness Presentations (annual activity)	GEA	Government organizations and schools; NGOs and private sector
	Seminar on Local Financing Opportunities for Renewable Energy and Energy Efficiency	GEA	Public Seminar
	Webinar on The Road to Sustainable Energy: Mapping our National and Regional Resources	CARICOM	Organizations responsible for energy in Member States

YEAR	INITIATIVES	FACILITATOR	TARGETED AUDIENCE
2016	METEONORM 7.1 and PV Sol 7.5 software and training	GIZ/REETA	GEA
	Monitoring & Evaluation of Renewable Energy	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Project Management	IPED	GEA
	Energy Awareness Presentations (annual activity)	GEA	Government organizations and schools; NGOs and private sector
	National Gender & Energy Workshop	OLADE and GEA	Government organizations and NGOs
	Energy Efficiency Training – On-site visits	OLADE and CONUEE	GEA
	Energy Efficiency Seminar	OLADE and GEA	Government organizations, technical institutions, University of Guyana and NGOs
	Energy Efficient Procurement	GEA	Public Seminar in Bartica
	Sustainable Energy Solutions for Remote Populations workshop	New York University	GEA and HECl
	Workshop on Energy Efficiency Standards and Regulations in Buildings	CARICOM	GEA and GNBS
	Training Workshop on the Rationale for Energy Efficiency in the Cooling Sector	CARICOM	Organizations responsible for energy in Member States
	Webinar on Island Power Systems: A Balancing Act	CARICOM	Organizations responsible for energy in Member States

Skills for Green Jobs in Guyana

YEAR	INITIATIVES	FACILITATOR	TARGETED AUDIENCE
2015	IRENA Global Atlas for Renewable Energy	International Renewable Energy Agency (IRENA)	GEA
	Introduction to Solar Photovoltaic Theory workshops	GEA	Mahaicony Technical and Vocational Training Centre Guyana Industrial Training Centre
	Hydropower Seminar: Applied Engineering for Small Hydro Power Projects: Practical Tips for Small Hydro Power Practitioners	GEA and Renewable Energy and Energy Efficiency Technical Assistance (REETA)	Public Seminar
	Climate Change Education for Sustainable Development National Orientation Workshop	NCERD	Government organizations
	National Electrical Code	Ministry of Public Infrastructure	Government organizations
	Energy Awareness Presentations (annual activity)	GEA	Government organizations and schools; NGOs and private sector
	Technical, economic and environmental management of biofuels	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Energy Statistical Capacity Building in the Caribbean	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Sustainable Energy Leadership Programme (SELP)	UNIDO	GEA
	Management of Wind and Solar Projects	OLADE	Government organizations involved in the Energy Sector in Member states; University of Guyana
	Use of Caribbean Climate online risk and adaptation tools	Office of Climate Change	Government organizations
	Diploma Certificate on Energy Development and Social Inclusion	OLADE/ University of Technology, Jamaica	Government organizations involved in the Energy Sector in Member states
	Arco Norte Interconnection Project workshop	Inter-American Development Bank (IDB)	GEA
	Sustainable Energy Information Management Program	OLADE	Government organizations involved in the Energy Sector in Member states

YEAR	INITIATIVES	FACILITATOR	TARGETED AUDIENCE
2014	Planning and Strategy for the Development of Bio-fuels	Dr Devon Gardner	Government organizations
	Hydropower Development	Mr Maurice Veacock	GEA
	Biogas Technology Workshop	Guyana School of Agriculture (GSA)	Government organizations
	Energy and Society: Environmental Impacts of Biofuels and alternatives for prevention and mitigation	OLADE	Government organizations involved in the Energy Sector in Member states
	Energy Efficiency and Renewable Energy Sources	Technische Universitat Dresden	GEA
	Workshop on Sustainable Energy Program for Guyana	IDB	GEA and HECI
	Energy Awareness Presentations (annual activity)	GEA	Government organizations and schools
	Elements of a Hydropower Feasibility Study	GEA & REETA	Public seminar
	Introduction to Solar Photovoltaic Theory workshops	GEA	Government Technical Institute Kuru Kuru Co-operative College
	Taking Account of Energy Efficiency in Procurement Seminar	GEA	Government Ministries and Agencies

ISBN 978-92-2-132913-8



9 789221 329138