

Extractives and Energy Transition
in East Africa:

Exploring Progress, Challenges
and Youth Opportunities

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Abbreviations and Acronyms

AFDB	African Development Bank
ASM	Artisanal and Small Scale
CO2	Carbon Dioxide
EB	Extractives Baraza
FIT	Feed-in-Tariff
GDP	Gross Domestic Product
GIZ	The Deutsche Gesellschaft für Internationale Zusammenarbeit
GW	Gigawatt
GWh	Gigawatt Hours
ILO	International Labour Organization
IOCs	International Oil Companies
IPP	Independent Power Producers
IRENA	International Renewable Energy Agency
LTWP	Lake Turkana Wind power
MW	Megawatt
NOGTR	National Oil and Gas Talent Register
NSD	National Suppliers Database
SDGs	Sustainable Development Goals
SOGA	Skills for Oil and Gas
TEITI	Tanzania Extractives Industries Transparency Initiative
TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme
VAT	Value Added Tax

Executive Summary

Extractives and energy transition in East Africa (Kenya, Uganda and Tanzania) raises a number of dilemmas and opportunities that are worth noting. While there have been efforts in achieving the desired transition towards a low carbon economy, the region has put immense efforts towards exploration and development of fossil fuels. The new discoveries of oil deposits in Kenya and Uganda and gas in Tanzania have pivoted the region into emerging oil countries that are keen on harnessing this nascent sector. Locally, the situation has led to heightened expectations on the job and business opportunities that the sector presents. This however does not negate the actual and potential impact in terms of job and business opportunities that the renewable sector presents.

To maximise potential of the extractives and renewables, governments in East Africa have put in place enabling policy and legal frameworks that seek to prioritise local skills and supply chains. This has however been more prominent in the extractives sector compared to the renewables. The renewable energy sector on the other hand has seen the government put in place favourable policies around certain incentives for instance tax exemptions for the specific technologies including those related to solar especially the photovoltaic cells and modules.

The heightened expectations in the two sectors have created an appetite for development of skills and capacity to take up opportunities as a response to the huge skills and capacity gap among the local populations especially the youth. While youth form an integral portion of the population, their participation has largely been hampered by lack of matching skills and those that meet the required standards in the sector. Governments, private sector and other actors have put in place initiatives to address this gap. As a result, some international oil companies and mining companies have put in place skills development programmes in form of scholarships for youth both locally and outside. This has involved collaborative efforts between companies and government training institutions for technical and vocations skills. Notably, increasing youth participation has to also involve robust policy frameworks and access to information which are currently lacking. Access to information is a plaguing challenge especially in the renewable sector.

This paper therefore provides an elaborate analysis of the extractives and renewables sector status, opportunities and challenges. Importantly a renewables value chain analysis is included to showcase the skills and employment needs that youth can take advantage of.

1 Context

1.1 Introduction

Kenya, Uganda and Tanzania have made tremendous progress in their efforts towards energy transition amidst their emerging oil and gas sectors. Discoveries of commercially viable fossil fuel deposits have resulted in heightened expectations among the populace because of the direct and indirect opportunities compared to the renewables energy sector. This situation has an implication on the successful energy transition. Correspondingly, citizens in these countries have taken advantage of the growing extractives sector to build their skills and business capacities to take up opportunities in the sector. Notably, there has been a rise in the number of youths taking up courses in technical areas like engineering, geology, plumbing, welding among others.

A number of programs have been initiated to support micro, small and medium enterprises (MSMEs) to develop the required standards and competitive edge to take up opportunities in the sector. More importantly, there have been efforts by governments to put in place local content policies and regulatory frameworks to support local participation. Equally, private sector players, including extractive companies, have put in place training programmes in the form of scholarships and partnerships with local training institutions to build the necessary skills for local citizens especially the youth. This has also been reflected in the enterprise related programmes to support local businesses.

Renewable energy has drawn much attention globally. This has seen a shift in funding by financiers towards projects that are climate friendly. As such, developing countries like Kenya, Uganda and Tanzania have put in more effort towards supporting the renewables sector to help supplement their energy needs while at the same time reducing carbon emissions. While the governments are focused on fully transitioning to clean energy, the plaguing question is what opportunities the renewable energy sector provides for local populations in terms of businesses and job opportunities either directly or induced. At the core of this is how the sector provides opportunities for the youthful population in the region who are largely unemployed and without the matching skills.

1.2 Scope and Purpose of the Paper

This issue paper is a sequel to an earlier issue paper that assessed how to strengthen youth participation in the extractives sector in East Africa in light of the Covid-19.¹ It assesses youth opportunities in the renewable energy sector by looking at the nexus between extractives and energy transition and the associated challenges. The paper discusses the context of extractives sector and energy transition in East Africa looking at Kenya, Uganda Tanzania.

The paper is structured around six sections. In this section, the paper provides the progress made especially in energy transition in the three countries any positions taken by governments in terms of investing in extractives especially oil and gas as well as mining. The next section looks at the nexus between extractives and energy transition followed by why youth participation in the two sectors is important. The goal is to put the youth in the region at the centre of extractives and energy transition and why it is important to factor in the youth in the whole debate while at the same time ensuring that youth have a place in the transition process. Importantly the section discusses youth participation in both the extractives and energy sector (renewables). It further highlights the renewables value chain and the occupations and skills needed for the different phases of the value chain. Importantly, this section further discusses the major forms of renewable energy in East Africa, namely solar, wind, geothermal and hydropower and looks at the employment opportunities that these sectors provide globally and how these can be translated locally for the youthful population. The last section discusses the common barriers and considerations for improving youth participation. This section discusses three key aspects that are an inhibiting factor in youth participation namely enabling policy framework, information asymmetry and skills and capacity challenges. The last section provides the conclusion and way forward.

1.3 Definition of Energy Transition

The international renewable energy agency defines energy transition as *a pathway toward transformation of the global energy sector from fossil-based to zero-carbon by the second half of this century.*² A significant focus on renewables has come as a result of the push towards achieving the energy transition globally. Regionally, African

¹ Kerecha G O, *Strengthening Youth Participation in the Extractives Sector: Considerations in Light of Covid-19* (Extractives Baraza, 2020).

²<<https://www.irena.org/energytransition>> accessed 9th November 2021.

countries have started embracing this but some feel that Africa need not suffer the same pressure to meet the global climate change timetables³ as it contributes only 2 per cent to the global CO2 emissions.

2 East Africa Context of Extractives (Oil, Gas and Mining) and Energy Transition

Energy remains an essential component of development, both in domestic and industrial use, in the East Africa region. The impending challenge is availability and access to sufficient, reliable and affordable energy. While energy remains a catalyst for investment and increased productivity, its potential remains largely untapped and underdeveloped in the region. The energy sector in these countries is mostly inaccessible to majority of the population characterized by a heavy reliance on biomass both for domestic and industrial use. One of the contributing factors is the huge cost of being connected to the main grid. Electricity and petroleum remain heavily used for commercial purposes although there is a combination of biomass for some industries like the cottage industry.⁴

The petroleum sector in the three countries is at its nascent stage especially with discoveries of oil in Kenya and Uganda as well as gas in Tanzania. The mining sector on the other hand is slightly at an advanced stage with Tanzania having made great strides followed by Kenya with the largest investment being the Titanium project in Kwale. Notably, the three countries have continued to expand their mining, oil and gas sectors as well as increasing renewable energy coverage. The extractives and energy sectors play an integral part in contributing to the gross domestic product (GDP) of these countries, although these contributions vary from one country to the other.

2.1 Kenya

The extractives sector in Kenya's dates back to the 1930s mainly in the mining of minerals and the 1950s in the exploration for oil and gas. The sector has seen a number of exploration efforts under different regimes with the sole aim of increasing their

³ <<https://energychamber.org/lessons-from-europe-africans-must-go-to-cop26-glasgow-the-rush-to-ban-fossil-fuels-will-backfire-in-africa-the-african-energy-chamber-set-to-release-its-2022-africa-energy-outlook/>> accessed 23rd November 2021.

⁴Energy sector in East Africa (Energylopedia)

<https://energylopedia.info/wiki/East_Africa:_Overview_of_Regional_Energy_Resources> Accessed 24 November 2021.

contribution to the GDP and significantly supporting development of the country's economy. The contribution of the sector to the GDP still remains low, with the mining sector specifically contributing a mere 0.7% GDP in 2019.⁵ The extractive sector has largely been enhanced by the discoveries and development of titanium in Kwale by the Base Titanium Ltd and the exploration and discovery of oil deposits in Turkana by Tullow Oil. These discoveries have created job and business opportunities for Kenyans including the youth. For instance, it has been estimated that large scale mining operations in Kenya employ around 9,000 workers and about 146,000 people are engaged in the ASM sector.⁶ There have been efforts to promote the participation of locals in the extractives sector largely through such regulations as the Mining (Use of Local Goods and Services) Regulations, 2017, Mining (Employment and Training) Regulations, 2017 as well as local content provisions in the Mining Act 2016 and Petroleum Act 2019.

The energy sector in Kenya has made impressive progress with the push towards clean energy while at the same time making contribution to the national grid. Notably, Kenya has a good energy mix characterized by among others geothermal, hydro, wind and solar. Geothermal development in Kenya dates back to the 1950s and currently the country has five power stations with a combined generation capacity of 713.13 MW⁷ making geothermal the major source of electricity in Kenya. As a result, geothermal accounts for 45 per cent of total electricity generation.⁸ Other sources of energy in the renewable energy sector like wind and solar performed impressively in 2019, while hydro and thermal had a drop in the same year. In 2019, wind generation reached 1,562.7 GWh making it the third largest source of electricity generation. In the same year, solar generation reached 92.3 GWh boosted by the commissioning of the Garissa Solar Power Plant. Hydro and thermal generation dropped to 3,205.3 GWh and 1,313.3 GWh, respectively, in the same year.⁹ This performance by the different sectors shows the significant contribution of the sector to the economy and more importantly creation of job and business opportunities for the youthful population.

⁵ Kenya National Bureau of Statistics, *Economic Survey* (Nairobi, 2020).

⁶ Kerecha G O, *Strengthening Youth Participation in the Extractives Sector: Considerations in Light of Covid-19* (Extractives Baraza, 2020).

⁷ Geothermal development in Kenya <<https://www.kengen.co.ke/index.php/business/power-generation/geothermal.html>> accessed 24 November 2021.

⁸ Kenya National Bureau of Statistics, *Economic Survey* (Nairobi, 2020).

⁹ Ibid.

2.2 Uganda

The oil, gas and mining sector in Uganda has attracted different expectations and interests both locally and internationally. The oil and gas exploration in Uganda has largely been in the Albertine region and dates back to 1920s. The commercial discoveries in 2006 resulted in heightened expectations and excitement for direct and induced job and business opportunities. To address these expectations and ensure that the local population benefits, the government has put in place local content requirements in its legal and regulatory framework governing the oil and gas sector. The Petroleum (Exploration, Development & Production) Act 2013, and the Petroleum (Refining, Conversion, Transmission and Midstream Storage) (National Content) Regulations, 2016, require oil companies including their subcontractors, to give preference to Ugandan citizens and entities in the provision of goods and services. Further to this, there is the National Local Content Bill, 2019, (National Local Content Act or Act) currently awaiting presidential assent. To ensure that no qualified businesses and individuals miss out on the opportunities in the sector, Uganda has put in place a National Oil and Gas Talent Register (NOGTR) and a National Suppliers Database (NSD) which is under the Petroleum Authority of Uganda. The Database provides a list of persons involved in petroleum activities in Uganda and prohibits any entity from providing goods, works or services for oil and gas activities unless they are registered on the Database.¹⁰

While the petroleum sector seems to be making good progress and attracting a lot of attention, the mining sector is still lagging behind in spite of its potential. This potential is manifested by the diverse mineral endowments in the country as well as its contribution of 30% of Uganda's export earnings in the 1950s and 1960s.¹¹ This potential needs to be harnessed to provide more opportunities to the locals especially the youth to eradicate poverty and stir up development in the country. The largest portion of national production is from the artisanal and small-scale mining which employs almost 200,000 Ugandans.¹² This marks the potential of the mining sector as whole which has been estimated to employ about 26.5% of Ugandans directly or through induced opportunities.¹³ Equally, the Mining Act, 2003 provides for

¹⁰ Kerecha G O, *Strengthening Youth Participation in the Extractives Sector: Considerations in Light of Covid-19* (Extractives Baraza, 2020).

¹¹ Uganda Investment Authority, *Uganda mining sector profile*, Undated.

¹² 'Developing Uganda's Mining Sector' (2013) <<https://www.worldbank.org/en/results/2013/03/19/developing-uganda-s-mining-sector>> accessed 24 November 2021.

¹³ Ministry of Finance (Uganda), *Uganda's Mineral and Mining Sub-Sector: What can be done to harness its full potential?* BMAU Briefing Paper (12/19) May 2019.

preference to Ugandan products and employment of Ugandan citizens to the maximum extent possible.

Uganda is equally endowed with many energy resources especially renewables including hydropower, biomass, solar, geothermal, peat and fossil fuels with a combined potential of 5,300 MW.¹⁴ This potential has largely remained untapped characterized by many Ugandans who are not able to access cheap, affordable and reliable energy for domestic and commercial use. In the renewable energy sector, Uganda has made some progress but rather at a snail pace. Biomass remains the vastly depended upon source of energy especially wood fuel, charcoal and other residues. Biomass, hydro and solar contributed about a quarter of Uganda's energy generation in 2018.¹⁵ While Uganda has unbundled its energy sector, assets used for the generation, transmission and distribution are government owned with the private sector players handling distribution function.

Hydropower remains the backbone of energy supply in Uganda with a potential of 2,00MW. Presently, the country has an installed capacity of 1,252MW attributed to the Karuma (600MW) and Isimba (183MW) hydropower dams.¹⁶ To realize this potential, Uganda has put in place a Hydropower Development Master Plan. Solar power generation remains attractive in Uganda as a good source of energy to boost the national grid. The country targets the generation of 5,000MW by 2040 which will make about 12% of the country's net generation capacity. By end of 2019, solar energy had reached generation capacity of 50.8MW. Based on its potential, solar has been viewed as a good alternative off-grid source of energy for rural homes. This has led to over 300,000 homes using the stand-alone solar home systems to address basic electricity needs.¹⁷ As part of increasing the coverage of solar energy, Uganda has partnered with development partners like UNDP to support rural communities and refugee camps access energy to power their settlements and businesses. These efforts have a ripple effect of creating more job and business opportunities for the youth in the country.

Investment in wind energy in Uganda has remained low largely due to the low quality of the wind resources available. Measurements conducted have shown that the

¹⁴ UNREEEA, Overview of Uganda's Renewable Energy Potential <https://unreeea.org/resource-center/overview-of-the-ugandan-energy-sector/> accessed 24 November 2021.

¹⁵ Get-invest, Uganda energy sector investment overview <<https://www.get-invest.eu/market-information/uganda/energy-sector/>> accessed 24 November 2021.

¹⁶ Van der Ven, M J, *working paper: An overview of recent developments and the current state of the Ugandan energy sector*, E-20046-UGA-1, June 2020.

¹⁷ Ibid.

wind resources in the country are only suitable for applications in small -scale electricity generation and water pumping. The available wind resources therefore fall short of the estimates required for large scale electricity generation.¹⁸ This situation has seen low investment in wind energy in the country. Other energy sources like geothermal has seen ongoing in exploration dating back to 1921 in Ugandan hot springs. Available data shows that geothermal generation capacity is 450MW with a target of achieving generation of 1,500MW from Geothermal by 2040. By end of 2019, the country had achieved 96.2MW which is about 6% of its targeted output.¹⁹

The legal and policy framework governing the extractive sector has strengthened government efforts towards increasing local participation. There have been tailored programmes towards building the skills and capacity of youth to serve diverse sectors including extractives and energy. These programmes include Skilling Uganda and the Youth Venture Capital Fund. These initiatives seek to address the skills gaps and access to investment funds in a bid to reduce unemployment and enhance innovation among the youth.²⁰ These efforts to a large extent act as a catalyst to increasing youth participation in the energy sector even as it grows over the coming years.

2.3. Tanzania

The extractives sector in Tanzania is characterized by mineral and gas deposits in large quantities. The country is endowed with diverse minerals from gold, iron ore, nickel, copper, cobalt, silver, diamond to tanzanite. Compared to Kenya and Uganda, the mining sector in Tanzania makes a significant contribution of up to 3.0% to the country's annual GDP.²¹ Gold mining contributed 5.2% to the GDP in 2019 and 6.4 % between January and September of 2020. This has been a steady increase over the years especially from 2014.²² The mining sector has largely continued to grow over the years attributed to the raft of changes made in the legal and regulatory frameworks as well as strengthened governance of the sector. The mining and quarrying sector directly employs 332,468 people making it among the top five sectors providing direct

¹⁸ Energypedia, wind, <https://unreeca.org/resource-center/overview-of-the-ugandan-energy-sector/> accessed on 24 November 2021.

¹⁹ Van der Ven, MJ, *working paper: An overview of recent developments and the current state of the Ugandan energy sector*, E-20046-UGA-1, June 2020

²⁰ 'Youth Apprentices Linked to 106 MSMEs' (Ugandainvest, 2016)

<<https://www.ugandainvest.go.ug/newsletter/issue2/Youth%20Apprentices.html>> accessed 24 November 2021.

²¹<<https://opentoexport.com/article/mining-sector-in-tanzania-1/>> accessed 24 November 2021.

²² NRGI, *Resource Governance Index: Tanzania* (2021)

employment among all sectors of the economy.²³ While this is the case, the sector is rapidly growing but there is a shortage of skilled labour. Certain skills are sought outside Tanzania although there are continued efforts between government and the mining companies to train locals to take up these opportunities.

Tanzania is also endowed with huge deposits of natural gas found at Songo Songo in Lindi region, Mnazi bay in Mtwara Region and Mkuranga in the Coast Region.²⁴ Natural gas reserves are estimated at 57 trillion cubic feet with a total annual production of 110 billion cubic feet from these three fields.²⁵ With the huge discoveries, the sector has good prospects to increase the country's wealth thereby creating more employment and business opportunities. Currently, the gas is being used for power generation to serve the local market. In the period ending April 2020 there were 500 domestic and 48 industrial customers connected to the natural gas infrastructure. The preceding year saw 400 vehicles consume 11.1 million cubic feet compared to 1.9 million cubic feet of natural gas used in 2018.²⁶ To ensure the citizens benefit from the oil and gas sector, Tanzania enacted the Local Content Policy of Tanzania for Oil and Gas Industry, 2014 and the Petroleum (Local Content) Regulations, 2017. The policy establishes guidance for realizing participation and transformation of Tanzanians. The regulations on the other hand govern local content matters related to petroleum upstream, midstream and downstream activities in Tanzanian Mainland. Importantly, one of the key focus areas is on capacity building and technology transfer which is central to helping Tanzanians develop the required capacity to plug into the sector. Other efforts have been through training programs in collaboration with IOCs and local TVETs to equip locals with diverse skills critical for the sector.²⁷ The extractives sector as a whole contributed to increased employment as well as procurement of goods and services in 2018/2019. The Tanzania Extractives Industries Transparency Initiative (TEITI) reported that extractives and service companies employed 526 foreigners and 5,848 Tanzanians in this period.²⁸

²³ Tanzania Extractive Industries Transparency Initiative, *The 11th TEITI Report for the Period July 1 2018 to June 30 2019*, June 2021.

²⁴ <https://energypedia.info/wiki/Tanzania_Energy_Situation> accessed 25 November 2021.

²⁵ <<https://www.tanzaniainvest.com/gas>> accessed 25 November 2021.

²⁶ Tanzania Extractive Industries Transparency Initiative, *The 11th TEITI Report for the Period July 1 2018 to June 30 2019*, June 2021.

²⁷ Kerecha G O, *Strengthening Youth Participation in the Extractives Sector: Considerations in Light of Covid-19* (Extractives Baraza, 2020).

²⁸ Tanzania Extractive Industries Transparency Initiative, *The 11th TEITI Report for the Period July 1 2018 to June 30 2019*, June 2021.

Energy transition in Tanzania has gained momentum just as in Kenya and Uganda. This is largely due to its impressive energy resources including hydropower, natural gas, wind, geothermal, biomass, solar, tidal, and waves.²⁹ The country has an installed generation capacity of 1,513 MW, or 0.033 kW per capita.³⁰ Tanzania has a history of relying on hydropower for electricity generation. There has however been a shift to natural gas which is currently providing over 20% of the total energy generation in the country. Notably, Tanzania has continued its investment in hydropower with a current installed capacity of 562 MW and a target of additional 4.7GW. The desire to increase this capacity has seen the government sign agreements with financiers like the African Development Bank (AFDB) to finance construction of hydropower plants. The geothermal sector on the other hand has seen a number of initiatives as exploration studies in several locations. The exploration studies have established an estimated potential of about 600 MWe. There are also efforts to develop about 200 MW over the next four years.³¹

The solar sector has however performed impressively compared to geothermal and wind. Solar energy is being developed both for off-grid and grid connected solutions. The sector has experienced an impressive uptake of solar energy especially for off-grid use to power homes and small businesses. About 24.7% of households in Tanzania in 2018 were powered using solar. To achieve a wider coverage and uptake of solar power, the government has removed value added tax (VAT) and import tax for main solar components such as panels, batteries, inverters, and regulators.³² These efforts are key to creating more business and job opportunities for the citizens especially the youth. Wind and bioenergy efforts are also underway and it is anticipated that they will have significant injection into the energy needs in Tanzania. Importantly, the ripple is anticipated to be on access to affordable and efficient energy that enables creation of jobs and business opportunities for majority of the citizens especially the youth.

²⁹ <<https://www.tanzaniainvest.com/energy>> accessed 25 November 2021.

³⁰ <<https://www.trade.gov/country-commercial-guides/tanzania-energy>> accessed 25 November 2021.

³¹ <<https://www.thinkgeoenergy.com/tanzanias-tgdc-plans-up-to-200-mw-geothermal-development-by-2025/>> accessed 25 November 2021.

³² Bishoge O K, Zhang L and Mushi W L, *The Potential Renewable Energy for Sustainable Development in Tanzania: A Review*, (MDPI 30, July 2018).

3 Nexus between Extractives and the Energy Transition

There is a huge reliance on natural resources especially extractives by the global economy. This is mostly due to massive revenues that it generates that are used by resource rich countries to fund development and support provision of services to their citizens. It has been estimated that 63 countries globally are dependent on extractives as an economic pillar.³³ Africa has 22 resource-rich countries whose fuel and mineral exports contribute over 20 percent to the GDP.³⁴

Beyond the generation of the huge revenues, the extractives sector remains a highly depended upon source of energy globally in spite of the ongoing concerns around its contributions to climate change and other negative impacts. This situation therefore creates a complex relationship between extractives and energy transition.³⁵ Another complexity is that globally, the industry is considered a key source of opportunities and revenues needed to support the realization of SDGs in resource rich countries by aligning extractive policies and practices with national development plans.³⁶ Notably, the industry has the capacity to support and contribute to the realization of 11 of the SDGs.

The discourse on energy transition globally and in Africa raises a number of concerns especially for those countries that are heavily dependent on fossil fuels as well as emerging economies. These countries have considered an energy mix through renewables like geothermal, wind and solar power as part of the energy transition process. To successfully realize a transition to cleaner and reliable energy system, fossil fuels need to be phased out. This will to a great extent negatively impact resource rich countries' ability to sustain their economies. In particular, emerging resource rich economies are bound to be grossly affected particularly those from Africa like Kenya, Uganda, Tanzania, Mozambique and Ghana that see this as an opportunity to develop their economies and lit many out of poverty. Should they stop or slow down their ambitions to explore and produce extractives resources amidst this global shift? For most African countries this would mean halting the exploration and production of their massive reserves of fossil fuels thereby impacting them negatively. The ripple effect of phasing out most of the extractive operations is that most economies are bound to have a huge reduction on their revenues leading to a strain on the realization

³³ World Bank, 'Extractives Industries' (2021)

<<https://www.worldbank.org/en/topic/extractiveindustries/overview#1>> accessed 15 October 2021.

³⁴ Africa Development Bank, *Africa's Natural Resources: The Paradox of Plenty*, October 2007.

³⁵ Dr. Xunpeng (Roc) Shi, *The Energy Transition and Extractive Industries Development in the Asia-Pacific Region* (A United Nations Roundtable, February 4 2021).

³⁶UNDP, *Extractive Industries and the Sustainable Development Goals* (OECD, Paris December 2, 2015).

of some of the most essential needs categorized under the SDGs. This will probably impact the pace at which the SDGs might be achieved within the projected timeframe. It is, however, good to note that countries will be affected differently depending on the level of their dependence on fossil fuels and the level of development of their extractives industry in general.

There has been a shift in financing of fossil fuels to put more funds into renewables because of ethical considerations by some financiers as well as a commitment towards supporting energy transition efforts. This has equally seen a number of companies cutting back on their commitment to new projects as a sign of their commitment to a cleaner and sustainable environment. For instance, some companies like Shell, BP and Rio Tinto have been involved in broader climate initiatives. Importantly these companies are members of the Energy Transition Commission, a cross-sector initiative of energy corporations, banks, research, and international organizations exploring the actions required to achieve a global transition to low-emission pathways.³⁷

It is however good to note that global financing institutions continue to fund fossil fuels projects globally including Africa. In 2020 alone, the world's largest commercial and investment banks increased their financing for fossil fuel projects compared to 2016. Some banks however cut their fossil fuels financing in 2020. There is therefore a mixed shift to financing fossil fuels projects by banks and other investment institutions. It seems to be a cautionary approach while at the same time banks are sending a message that they are committed to achieving net-zero.

Another plaguing question is around how to ensure a just transition that secures peoples livelihoods and jobs. This is mostly for those who have largely been dependent on extractives for jobs and livelihoods. There is a push towards ensuring that energy transition should be one that minimizes disruption of workers and communities reliant on energy sources like fossil fuels and coal.³⁸ Of importance is to ensure that these workers and communities are supported through economic diversification plans and are adequately supported and reskilled where necessary during this transition.³⁹ In spite of this situation, energy transition has been viewed as one presenting enormous opportunities, such as jobs for low and middle income countries that have the natural resources needed for renewables. For instance, the International Renewable Energy Agency (IRENA), in its renewable energy and jobs

³⁷ Kosciulek D, *Strengthening Youth Participation in Climate-Related Policy Making* (South African Institute of International Affairs, December 2020).

³⁸ Georgia et al. *Realizing a Just and Equitable Transition Away from Fossil Fuels* (SEI discussion brief, January 2019).

³⁹ United Nations, *Transforming Extractive Industries for Sustainable Development*, (Policy –Brief May 2021).

review, documented that renewables accounted for 11.5 million jobs worldwide in 2019.⁴⁰ The energy transition has created a rise in the demand for critical minerals like rare earth and metals that are needed to support these efforts. This has the consequence of enabling low- and middle-income countries that are endowed with these resources to diversify their economies while at the same time ensuring that human rights standards are adhered to as well as ensuring sustainable extraction.

4 Why youth Participation in the Extractives and Energy Transition Matters

Youth involvement has been at the heart of the efforts to decarbonize the energy sector through a push for cleaner and more efficient forms of energy. There have also been similar efforts for youth participation in the extractives sector globally and Africa in particular. Youth form a larger portion of the world population. It has been estimated that the world will have about 1.3 billion youth by 2030. In Sub-Saharan Africa, youth make 20% of the total population, a situation that is expected to remain the same for the next 20 years.⁴¹ Therefore, youth form a sizeable portion of the global population making them an important cluster that need to be involved when addressing issues related to sustainable development in the context of extractives and energy transition.

The youth remain a vulnerable population especially in Africa, and one that is definitely affected and will bear the impacts of climate change not only on the environment but also access to the most basic necessities including livelihoods, electricity, water, food and employment among others. Therefore, youth need to be viewed not only as beneficiaries as is the case in most instances, but active participants that play a vital role in shaping policy and practice processes that relate to extractives and energy transition at the local, regional and global scale. Furthermore, debates and decision-making spaces around extractives and energy transition are high level in nature and mostly accessible by experienced professionals who are largely the older folks. This situation has locked out the youth not only are an important cohort, but equally affected and their needs, vulnerabilities and rights should be reflected in policies and in policymaking processes.⁴²

⁴⁰ IRENA, *Renewable Energy and Jobs* (Annual Review, 2020).

⁴¹ United Nations, *The World Youth Report: Youth and the 2030 Agenda for Sustainable Development* (Department of Economic and Social Affairs, 2018).

⁴² Kosciulek D, *Strengthening Youth Participation in Climate-Related Policy Making* (South African Institute of International Affairs, December 2020).

With the ongoing shifts and changes in the extractives sector as a result of energy transition efforts, youth participation is pegged on their knowledge, skills and capacities. These are key for them to secure opportunities for themselves but also to be able to meaningfully plug into the discourses around policy and practice. Therefore, youth participation is so central to a successful energy transition process that is equally alive to the needs and aspirations of youth as a significant portion of the global and African population.

4.1 Youth Participation the Extractives and Energy Sector in East Africa

Youth participation in the extractive and energy sectors is varied. Notably youth remain an important part of the sustainable development efforts that are being driven by the push towards phasing out fossil fuels and replacing it with cleaner energy sources like wind, geothermal, solar and biofuels. This entire process has seen youth participate differently, a situation that can be attributed to a number of different factors. These sectors present opportunities key to addressing not only youth unemployment but also skills development and participation in shaping policy and practice. East Africa has high unemployment rates and most of the governments have seen the extractives and energy sectors as key to addressing this problem especially among the youthful population. While this is the case, the sectors present opportunities for youth to engage in diverse ways.

4.2.1 Youth participation in the extractives sector.

The East Africa countries have emerging oil and gas sectors propelled by discoveries of commercially viable oil in Kenya and Uganda and gas in Tanzania. This situation has cast a sharp focus on the potential of the sector to address challenges facing youth and creating jobs, skills development and business opportunities for the youth. It has been observed that the extractives value chain presents a number of opportunities for the youth. Considering that the extractives sector is a highly specialized and complex sector, youth can take up the available opportunities if they are well prepared through training to have the desired skills and standards.⁴³

The sector presents direct and indirect opportunities for skilled and semiskilled youth. While only a small number of youths are and can be employed, massive opportunities are in the supply of goods and services. However, substantial

⁴³ Kerecha G O, *Strengthening Youth Participation in the Extractives Sector: Considerations in Light of Covid-19* (Extractives Baraza, 2020).

opportunities are still available in the development phase. In Uganda for instance, findings show that development projects will generate thousands of direct jobs with a peak of 13,000 workers in the construction phase and of 3,000 people in the operation phase. Out of the total manpower required, 15 per cent are engineers and managers, 60 per cent are technicians and craftsmen and 25 per cent are people without any educational background ('unskilled').⁴⁴ The challenge for most youth in the East African region however is that they do not have the skills that match or meet the industry standards and requirements, a situation that has tended to lock out majority of the youth.

In a bid to address this situation, a number of initiatives have been put in place to support youth through skills building. Some of these initiatives include among others the Skills for Oil and Gas (SOGA) by GIZ, Youth in Extractives Programme by Extractives Baraza to build their capacity and competence to plug into the sector. Other efforts have been spearheaded by governments towards strengthening vocational skills through the existing training institutions and ensuring that they match the industry requirements. These efforts have been replicated across the three countries especially for technical skills like welding, electrical and plumbing. This has been a result of a realisation that equipping the youth with technical skills is key in preparing them to take up opportunities in the sector as well as meeting the present and future skills needs beyond the extractives sectors. Other opportunities for youth to plug into the sector are through innovations. A number of innovative initiatives, like the Uvumbuzi Hub by the Extractives Baraza, continue to provide a platform for youth to participate in the sector. Youth are able to come up with innovations to address diverse industry needs including those around environment, safety and health which are at the heart of the industry operations.

While there have been projections that the direct (employment) and indirect (business) opportunities are available along the value chain especially the midstream and downstream phases, the current situation speaks differently. There seems to be a mismatch between the projections and the reality on the ground with a majority of the youth not being able to secure the available opportunities. As the energy transition push gathers momentum, there are opportunities in the mining sector linked to the increased demand for strategic minerals critical in supporting energy transition efforts into energy sources like wind and solar. This means that with good policies, East African countries are able to strengthen their mining sectors and put in place policies

⁴⁴ A Langer, U Ukiwo & P Mbabazi (eds), *Oil Wealth and Development in Uganda and Beyond: Prospects Opportunities and Challenges*, (Leuven, Leuven University Press, 2020).

that prioritize local citizens and especially the youth through direct and indirect opportunities in the mining sector.

4.2.2 Youth Participation, Opportunities and Skills Demand in Renewables

Energy access in East Africa remains low with less than a quarter of the region's population having access to electricity.⁴⁵ With the energy sector rapidly changing globally as well as in the East Africa region, investment particularly in the solar and wind energy has experienced an increase. This has resulted in a rise in demand for alternative sources of energy like solar energy mainly for lighting homes and businesses. Important to note is the opportunities that these alternative sources are creating for youth through direct jobs as well as businesses (supply of goods and services). The renewable energy sector created 11.5 million direct and indirect jobs globally in 2019. Majority of these jobs have been in the solar, bioenergy, hydropower and wind power.⁴⁶ This indeed shows the potential of the sector to create the much-needed jobs and businesses for the youth.

While the renewable energy sector is promising, a number of skills are required that most young people from the East Africa region already have while others do not exist. There is a demand for technical, business, administrative, economic and legal skills among others. As the sector grows and advances, there is need to strengthen the capacity of youth through technical, administrative, business and other soft skills that match the industry needs and standards. These are skills that can be acquired through existing learning institutions locally and collaborative efforts with institutions outside the region. An elaborate programme of this nature in the long run will build a critical mass of skilled nationals with the capacity to take up opportunities in the sector.

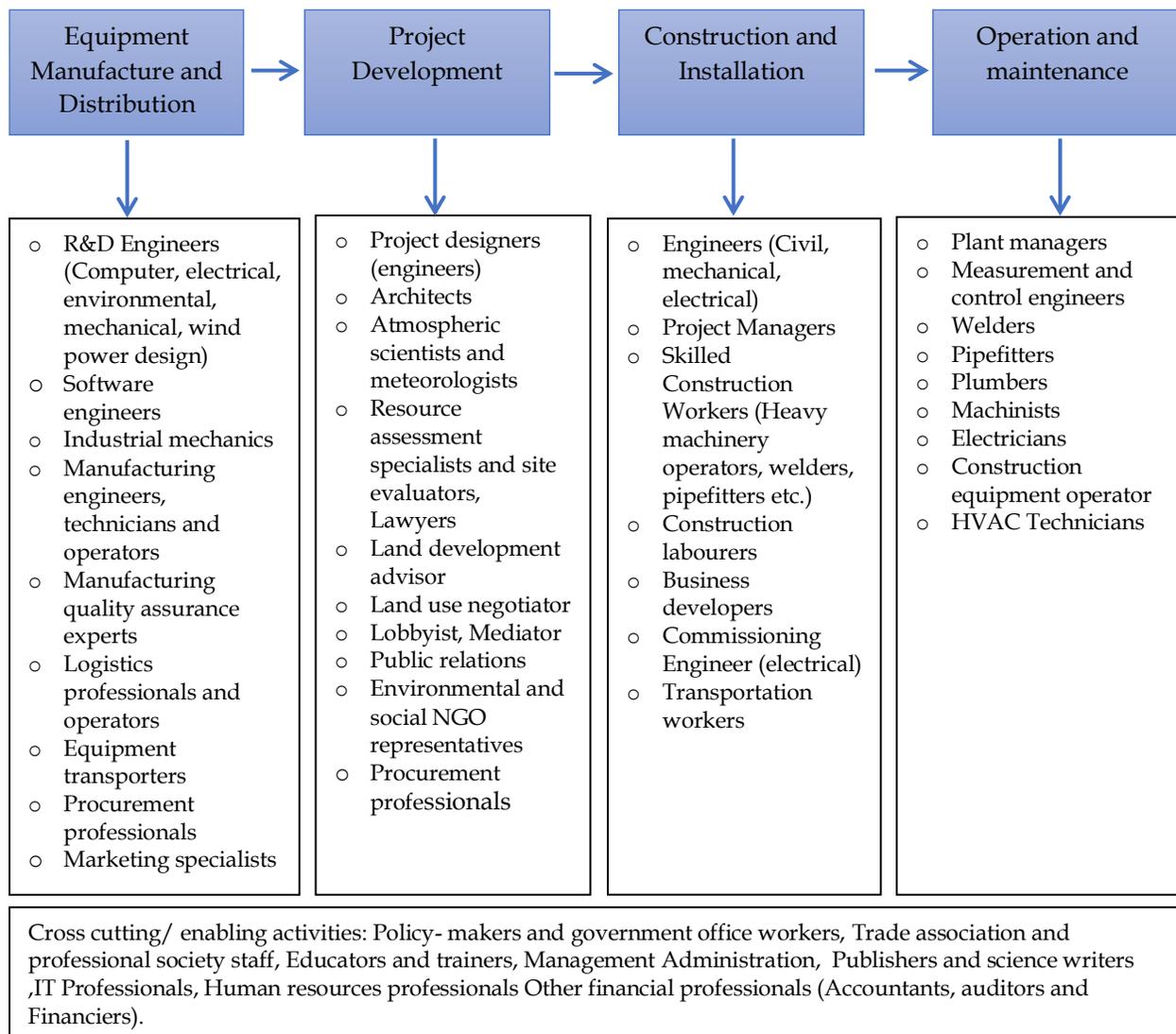
Renewable Energy Value Chain: Skills and Employment Needs

This table highlights the skills and occupational needs for the renewables energy sector across the entire value chain. The table also highlights cross-cutting skills that youth in the East African region have or could consider to develop to be able to plug in to the various sectors.

⁴⁵ Gordon E, *The Politics of Renewable Energy in East Africa*, (Oxford Institute for Energy Studies, 2018).

⁴⁶ Ferroukhi R et al., *Renewable Energy and Jobs – Annual Review 2020*, (International Renewable Energy Agency, Abu Dhabi, 2020).

Source: ILO, Skills and Occupational Needs in Renewable Energy, 2011



The renewable energy value chain presents diverse opportunities right from the manufacture, distribution of equipment to operation and maintenance. Other skills are needed in the operation and maintenance of these facilities⁴⁷ as well as skills around project management, community relations and legal skills to address contractual matters related to projects. Importantly, majority of these opportunities are in the

⁴⁷ International Labour Organization, *Skills and Occupational Needs in Renewable Energy*, 2011.

development phase (construction and installation) which is labour intensive compared to operation and maintenance of the installations once in operation. This differs among the different subsectors. For instance, compared to solar and wind energy, the bioenergy sector has an additional value chain stage: growing and harvesting biomass. It is equally important to note that while the energy sector and especially the renewables require new skills, existing skills, both technical and soft, are still required. This therefore creates a wide range of opportunities for youth with already required skills but also an opportunity to develop the required skills to the standards and needs of the fast-growing sector in the region.

This paper discusses three renewable sources of energy, namely solar, wind and hydropower to assess the coverage and the opportunities available for youth participation in the renewable energy sector. Importantly, youth may consider venturing into the sectors by acquiring relevant skills that match the needs for each of the sector. These skills range from technical skills like engineering e.g., mechanical, electrical, civil to non-technical skills like planning consultants, land development advisors, environmental legal consultants, health & safety consultants among others.⁴⁸

Solar Energy

The east Africa region is seen as a highly lucrative region for solar power due to it falling in the solar belt region. The solar power in the region has taken a two-pronged approach including the installation of independent roof top panels largely used for lighting homes and small businesses. The second approach has been the use of integrated mini grids with backup generators in situations when there is no sun.⁴⁹ This source of energy has been a workable and largely affordable alternative to the main grid. As result of this and east Africa's unique positioning, as a solar belt, there has been a rapid expansion and uptake of solar energy as an alternative to other forms of energy especially connection to the main grid.

It is important to note that the east African governments have put in place programmes like the Feed-in-Tariff (FIT) to enable achievement of their renewable energy targets. These initiatives include those geared towards increasing their solar energy coverage and production. Kenya for instance has put in place a programme to

⁴⁸ Malamatenios C, *Renewable Energy Sources: Jobs Created, Skills Required (And Identified Gaps), Education and Training*, (EDP Sciences, 2016).

⁴⁹ The Emergence of Solar Energy in East Africa <<https://strathmore.edu/news/the-emergence-of-solar-energy-in-east-africa/>> accessed 25 October 2021.

clean up dirty diesel plants hybridizing 15 off-grid diesel power stations with solar and wind. Impressively, there has been an uptick of solar water heating a situation proving the reliability of solar power. To achieve these increases, East African governments have put in place incentives in the form of tax exemptions for the specific technologies including those related to solar especially the photovoltaic cells and modules. Tanzania and Kenya have additional tax exemptions, such as the removal of value-added tax on solar products.⁵⁰ With these exemptions, there has been a surge in the solar power projects and installations. This situation in a sense may have and could potentially create more jobs for the youthful population in these countries.

Considering its strategic advantage, Sub-Saharan Africa has the potential to create significant job opportunities through investment in solar power. Statistics indicate that through Solar PV, the region is able to contribute up to 65% of total jobs in the energy sector by 2050.⁵¹ The ripple effect of this is that, more access to solar power generates more opportunities for the population especially for youth who are able to have lighting to study as well as light their businesses. Equally, there are indirect and direct job opportunities as the sector continues to grow and contributes positively to the economy more people will have access to opportunities especially jobs and supply of goods and services. Youth are therefore bound to benefit through the available opportunities in the short and long-term.

Other opportunities for youth participation in the solar energy involve innovation. There have been a number of initiatives supporting youth innovation in the energy and extractives sector in East Africa. These initiatives and push to provide alternative sources of energy to most rural homes not connected or able to afford main grid rates, have created an opportunity to innovate. For instance, there have been designs for low-cost solar lamps. A case in point is Evans Wadongo's innovation that designed a low-cost solar lamp targeting low-income households. This innovation sought to replace the use of kerosene lamps for cheaper solar powered lanterns by relying on locally available scrap metal and solar panel fragments. Through this innovation households have been able to light their homes, charge their phones and radios in a cheaper and reliable way.⁵² As such youths have an opportunity to provide practical solutions to communities through innovations on alternative sources of

⁵⁰ Alternative Energy in East Africa: The case for solar power <<https://www.marsdd.com/news/east-africa-solar-power-innovations/>> accessed 9 November 2021.

⁵¹Heffron , R J, *Inclusive Energy Transition, Commonwealth Sustainable Energy Transition Series 2021/01*, (Commonwealth Secretariat, London, 2021).

⁵² African Capacity Building Foundation (ACBF), *Compendium of Case Studies on Youth and Managing for Development Results (Mfdr)*, 2017.

energy especially for lighting. These innovations need to be viewed in the context of business ideas that have the capacity to create jobs for other youths in the region.

While this case is a success, there is need for more support to local innovators through training and financing of their innovations. This is key in developing local capacities to provide local solutions in the transitioning energy sector. Importantly, this kind of support needs to take long-term approach to achieve the desired results and capacities to match global standards.

The reliance on main-grid mainly for businesses has had its share of risks. East Africa reliance on electricity to power businesses has been quite shaky due to power outages that have resulted in huge business losses. It has been estimated in Kenya, Uganda and Rwanda that 89%, 82% and 39% of businesses respectively experience power shortages annually. This has resulted in significant loss of businesses of between 5% and 70%.

Solar power is seen as reliable alternative which drastically reduces the downtime thereby increasing opportunities for doing business.⁵³ Considering this reliability, youth have even more opportunities to engage in entrepreneurial initiatives powered by solar energy which in the long-term cuts on costs of operations especially on the utility bills. It has been observed that business opportunities emerge through the use of solar power and household income is increased.⁵⁴

Wind Energy

Wind energy is gaining ground in Africa. Most African, especially in East, North and Southern Africa, have excellent wind resources with some East African countries like Kenya, Uganda and Ethiopia having high wind quality. There is an upward increase in the investment in wind power with projects such as the Lake Turkana Wind Power (LTWP) project in Kenya. This project aims to provide 300MW of reliable, low-cost wind energy to the national grid, equivalent to over 20% of the current installed electricity generating capacity.⁵⁵ A majority of the wind energy projects globally are onshore. There is however an increase in the offshore investments largely in Europe and China. Offshore installations seem to be more involving and can make use of skills from offshore oil and gas when it comes to setting up the necessary

⁵³ PV-Magazine, Solar can Energize the East African Recovery < <https://www.pv-magazine.com/2021/03/22/solar-can-energize-the-east-african-recovery/> > accessed 9 November 2021.

⁵⁴ GOGLA, *Powering Opportunity in East Africa: Proving Off-Grid Solar is a Power Tool for Change* (September, 2019).

⁵⁵ African Development Bank, *Lake Turkana Wind Power Project: Updated Environmental and Social Impact Assessment Summary* (December 2011).

platforms and other essential installations. Available data on wind power employment has largely focused on America, China, Asia and Europe. Based on the available data, the sector does provide opportunities for youth with the right skills from Africa as well.

Wind power globally creates about 1.2 million jobs through onshore and offshore projects.⁵⁶ This potential has been reflected in the wind projects in Africa like the LTWP through direct and indirect jobs. These opportunities are generally present during the development and installation phase. For instance, 2,500 people including expatriates were employed during construction of the LTWP project.⁵⁷ Majority of those employed were from communities hosting the project. The wind power projects also present other opportunities through supportive infrastructures like roads which in most instances are constructed and improved to access project sites. Notably, the wind energy value chain presents several opportunities for direct and induced employment. In Uganda for instance, the wind energy projected to have the potential of creating reliable jobs along the value chain. These jobs include those around development of wind energy systems, audit of energy projects, installation, infrastructure and system maintenance, business and sales, as well as linkages to other sectors of the economy.⁵⁸

The current push for cleaner energy has created an interest in the ability of wind energy to generate electricity. This situation has created a demand for new skills as well as strengthening existing skills that can be used across several sectors. Importantly, there are skills required at the equipment manufacture and distribution phase such as assembly and marketing, project development phase which requires environmental and social impact experts as well as those with legal backgrounds key to drawing up land use agreements. Other skills required are those in construction and installation including grid connection, turbine erection and infrastructure development. Moreover, skills in operation maintenance and cross-cutting skills like training, health and safety as well as communication and finance are sought after in the wind energy sector. Solar energy still takes the lead in the number of job and business opportunities it offers especially in the East African region which is heavily solar oriented compared to wind energy.

⁵⁶ IRENA, *Job creation* <<https://www.irena.org/benefits/Job-Creation>> accessed 11 November 2021.

⁵⁷ Finfund, *Socio-economic Impact of Lake Turkana Wind Power in Marsabit* (April, 2020).

⁵⁸ Wabukala B et al, *Assessing wind energy development in Uganda: Opportunities and challenges* (Wind Engineering, 2021).

Hydropower

Hydropower remains one of the most reliable forms of renewable energy around the world. East African countries like Kenya have relied on hydropower for many years to generate electricity and support the economy. Kenya for instance has a total installed large hydropower capacity of 826.23 MW. Small hydro potential is estimated at 3,000MW, of which it is estimated that less than 30MW have been exploited and only 15MW supply the grid.⁵⁹ Uganda on the other hand has a total of 1034.4 MW capacities from hydropower generating a total of 3985.74 GWh. Uganda also has around 20 small hydro schemes, totalling about 145 MW, which are generally privately owned and operated by the Independent Power Producers (IPP).⁶⁰ Tanzania's hydropower has continued to play a significant role in supporting the economy over the years. The country has a potential of 4.7 GW but currently has an installed capacity of 562 MW with further developments underway to realize its full capacity.⁶¹ Hydropower has the largest installed capacity in the renewables energy sector in Kenya, Tanzania and Uganda a reflection of the global renewable energy sector.

The sector created over 2 million direct jobs globally in 2018 with most of the jobs, up to 70%, being in operations and maintenance.⁶² This can be attributed to longevity of hydropower facilities which require continuous operation and maintenance which also tends to provide secure and permanent employment.⁶³ Most of the jobs globally are in countries like India, China and Brazil that account for up to 42% of the total jobs globally. Beyond power generation, hydropower projects do provide other direct and induced benefits among others tourism, infrastructure development for access to the power plants and other services like schools and hospitals as well as contributing to food security. Employment data on hydropower related projects globally and more so in Africa remains scanty. It is however been noted that large hydro projects provide more direct and induced opportunities including jobs and supply of goods and services. As a result, youth have opportunities to take advantage of. While this is the case, there is scant or no disaggregated data on employment including that of youth.

⁵⁹ EPRA, *Hydro Energy* <<https://renewableenergy.go.ke/technologies/hydro-energy/>> accessed 16 November 2021.

⁶⁰ The International Journal on Hydropower and Dams, *Country profile: Uganda* <<https://www.hydropower-dams.com/country-profiles/uganda/>> accessed 16 November 2021.

⁶¹ The International Hydropower Association (IHA), *Country profile: Tanzania* <<https://www.hydropower.org/country-profiles/tanzania>> accessed 16 November 2021.

⁶² Renner M, García-Baños C & Khalid A, *Renewable Energy and Jobs Annual Review*, (IRENA, 2019).

⁶³ International Labour Organization, *Skills and Occupational Needs in Renewable Energy*, 2011.

The main employment opportunity remains at the project development and construction, manufacturing and installation phases. While the operational and maintenance phase provides jobs on the long-term, these jobs tend to be few considering labour intensity tend to decrease at this phase and in the long run. Notably, skills from hydropower can be transferrable to other sectors and projects over time. For youth interested in the hydropower sector, there are opportunities to engage at hydropower value chain from manufacture to operation and maintenance. This requires the youth to have the requisite skills to be able to plug in. These opportunities are open to technicians involved in manufacturing the required equipment, offer installation services, ongoing operation and maintenance of the plants. Beyond technicians, the sector also provides opportunities for those with skills ranging from plumbing, electrical, logistics operators, construction engineers as well as those with experience in drilling.

5 Common Barriers and Considerations for Improving Youth Participation

The energy transition is gaining traction globally as well as in Africa especially in the strengthening of existing (geothermal and hydropower) and emerging sectors like wind, solar and biofuels. This situation while presenting many opportunities for youth, also presents a number of challenges that act as barriers particularly in East Africa. This situation varies from country to county with some being ahead while others are in the nascent stages in the different sectors. Other challenges are around enabling policy frameworks which in most instances do not factor in youth and the necessary supportive infrastructure.

5.1. Enabling Policy Framework

The current policy frameworks have largely focused on propelling the East Africa region into a renewable powerhouse through various incentives largely around tax exemptions on key technologies and equipment. Majority of these policies have not focused on building local skills and capacities to match and supply the sector needs but have tended to benefit large investors. This is despite the East Africa Community (EAC) considering youth as an asset both in the present and future. Although the EAC policy on youth requires governments to prepare youth not only as leaders but entrepreneurs because of their vital contribution to socio-economic development in the

region,⁶⁴ this remains untapped largely in the renewables sector. To achieve the desired youth participation in the sector, there is need to deliberately put in place enabling mechanisms through the existing policies to spearhead training and capacity strengthening for youth around the renewables sector. These mechanisms need to build on the already existing frameworks that provide for affirmative action, integration of youth into the national agenda and realization of country visions as well as sustainable development goals. In Kenya for instance, the government enacted the Kenya Youth Development Policy 2019. The policy recognizes that the youth are an essential component of the nation's development including realization of the Big Four Agenda, vision 2030 and the Sustainable Development Goals (SDGs).⁶⁵ This policy seeks to adhere to the African Youth Charter that requires state parties to develop a comprehensive and coherent youth development policy. Putting in place such enabling policy environment and operationalization mechanisms is central to helping build youth capabilities to access opportunities for development.

The extractives sector in East Africa has shaped policy and practice around local participation. This has seen the enactment of local content polices requiring the prioritization of local goods, services and employment opportunities for those who are qualified. Some of these local content policies have also focused on skills upgrading and transfer to enable locals take up opportunities in the extractives sector. These efforts can also be replicated in the renewables sector so as to localize certain aspects of supply chain especially supply of skills, goods and services. The goal should be put in place an elaborate renewables local content policy and plans that aim at strengthening local skills and supply chains.

5.2. Information Asymmetry

The transition to a low carbon economy and the opportunities associated with the renewables remain complex and scanty in some cases. This manifests itself in the low participation of youth in direct and induced opportunities in the sector. For instance, information on job opportunities in the renewable energy sector is generally lacking in the region. As result, there is need to ensure that youth have access to information and understanding about the energy transition into renewables and the

⁶⁴ East Africa Community, *EAC Youth Policy*, 2013.

⁶⁵ Ministry of ICT, Innovation and Youth Affairs State Department for Youth Affairs, *Kenya Youth Development Policy: Empowered Youth for Sustainable Development*, 2019.

benefits associated with. This information needs to include the benefits that the sector presents and how youth can prepare and take advantage of direct and induced opportunities. One way to address this problem is to conduct in-depth research by systematically collecting both quantitative and qualitative data of the sector. The collected data should be disaggregated for the different renewable energy sectors as well as opportunities available for men, women and youth with different skill sets. Creation of a national renewables database that is regularly updated with the latest data on the opportunities, employment trends and new projects will help cut back on the information asymmetry that currently exists. Such a database should be publicly available to all citizens.

5.3. Skills and Capacity Challenges

The efforts to transition to clean energy in East Africa, has had its share of challenges when it comes to the skills required in the renewables energy sector. While there have been policy efforts to support establishment of plants and scaling up of most of these projects, there has been little focus on building local skills to meet the skills demand in the sector. Due to the diverse nature of the renewables energy sector including the attendant technologies, a wide range of skills and occupations are required.⁶⁶ While this situation presents many opportunities it also poses a challenge for many youths. There is a general problem of majority of the youth not having the matching skills (some skills do not meet the industry standards) for the renewables sector. A huge number of the youths are not taking advantage of the opportunities available to learn the required skills. Documented data shows that there is widespread skills shortage of technical skills like engineers and technicians in all renewables energy sector in developed and developing countries. This shortage is also present in the non-technical skills including legal, sales, economics etc. Notably, there is demand for qualified design engineers with relevant knowledge and experience in renewable technologies. The wind energy sector for instance needs engineers as well as specialized wind turbine technicians. The hydropower and the bioenergy suffer from lack of qualified engineers and appropriately trained technicians largely in the emerging countries.⁶⁷

To bridge this gap, there is need for the existing learning institutions in east Africa at the technical, vocational and university level to promote skills around

⁶⁶ IRENA, The European Commission and ILO *Accelerating SDG7 Achievement Policy Brief 13: Interlink ages Between Energy and Jobs*, (United Nations Department of Economic and Social Affairs, Undated).

⁶⁷ Malamatenios C, *Renewable Energy Sources: Jobs Created, Skills Required (and Identified Gaps), Education and Training*, (EDP Sciences, 2016).

different specializations like electrical and mechanical engineering, plumbing, sociology, environmental, legal etc. as critical specializations on demand in the renewables and other related sectors of the economy. There is need also to tailor these courses and specializations to the renewables energy sector and to match the ever-changing landscape in the sector. This will ensure that the skills churned out meet the sector needs and standards. To provide the needed skills set, labour market dynamics should be monitored as well as projections of likely skills needs. This can better be achieved through a strengthened coordination between the renewable energy sector and educational institutions in developing renewable energy curricula, integrating renewables modules into vocational training courses, supporting apprenticeships, and establishing common quality standards.⁶⁸ Notably, there is need to upgrade and strengthen existing skills from other sectors/industries of the economy that can be applied in the renewables sector. This is applicable largely for technical and engineering skills as well as those on information technology.

6. Conclusion

The success of a just transition to clean energy forms like wind, solar, hydropower, geothermal and bioenergy is pegged on a holistic approach around robust policy, access to information and skills development. While there have been efforts by the East African countries specifically Kenya, Uganda and Tanzania to incentivize the use of renewables, there has been little focus on building the local capacity to provide skills and strengthen the supply chains for goods and services. Without a deliberate focus on these aspects, the renewables sector may not benefit the local economies in a sustainable way. There is also the challenge and reality of a budding oil and gas sector with the recent discoveries. The governments of these three countries are keen on developing these resources while at the same time striving to meet their commitments on energy transition. This raises several challenges as to how to strike a balance between renewables and fossil fuels efforts. The global shift in terms of investment and funding raises issues that will to a large extent influence how these governments make decisions in advancing their quest to be oil and gas producers. Another issue of concern is around supporting youth participation in extractive and renewable energy sectors but more especially the renewable sector. These calls for policy formulation on local content in relation to renewables that will help build local capacity through development and strengthening of skills as well as strengthening local supply chains to be able to have a competitive edge to take up available job and business

⁶⁸ Ibid.

opportunities. It is also commendable that there are positive strides made by these governments which are already creating opportunities as the renewables sector grows. There is need to learn from these outcomes and build on them to broaden the impacts to a large portion of the population especially the youth. Training and skills building remains a transformative approach that calls for both industry and training institutions collaborating to achieve skill sets that match the sector and can be transferable to other sectors of the economy.

Bibliography

- Africa Development Bank, *Africa's Natural Resources: The Paradox of Plenty*, October 2007.
- African Capacity Building Foundation (ACBF), *Compendium of Case Studies on Youth and Managing for Development Results (Mfdr)*, 2017.
- African Development Bank, *Lake Turkana Wind Power Project: Updated Environmental and Social Impact Assessment Summary* (December 2011).
- Alternative Energy in East Africa: The case for solar power <<https://www.marsdd.com/news/east-africa-solar-power-innovations/>> accessed 9 November 2021.
- Bishoge O K, Zhang L and Mushi W L, *The Potential Renewable Energy for Sustainable Development in Tanzania: A Review*, (MDPI 30, July 2018).
- 'Developing Uganda's Mining Sector' (2013) <<https://www.worldbank.org/en/results/2013/03/19/developing-uganda-s-mining-sector>> accessed 24 November 2021.
- East Africa Community, *EAC Youth Policy*, 2013.
- EPRA, *Hydro Energy* <<https://renewableenergy.go.ke/technologies/hydro-energy/>> accessed 16 November 2021.
- Ferroukhi R et al., *Renewable Energy and Jobs – Annual Review 2020*, (International Renewable Energy Agency, Abu Dhabi, 2020).
- Finfund, *Socio-economic Impact of Lake Turkana Wind Power in Marsabit* (April, 2020).
- Georgia et al. *Realizing a Just and Equitable Transition Away from Fossil Fuels* (SEI discussion brief, January 2019).
- GOGLA, *Powering Opportunity in East Africa: Proving Off-Grid Solar is a Power Tool for Change* (September, 2019).
- Gordon E, *The Politics of Renewable Energy in East Africa*, (Oxford Institute for Energy Studies, 2018).
- Heffron, R J, *Inclusive Energy Transition, Commonwealth Sustainable Energy Transition Series 2021/01*, (Commonwealth Secretariat, London, 2021).

International Labour Organization, *Skills and Occupational Needs in Renewable Energy*, 2011.

IRENA, *Job creation* <<https://www.irena.org/benefits/Job-Creation>> accessed 11 November 2021.

IRENA, *Renewable Energy and Jobs* (Annual Review, 2020).

IRENA, The European Commission and ILO *Accelerating SDG7 Achievement Policy Brief 13: Interlink ages Between Energy and Jobs*, (United Nations Department of Economic and Social Affairs, Undated).

Kenya National Bureau of Statistics, *Economic Survey* (Nairobi, 2020).

Kerecha G O, *Strengthening Youth Participation in the Extractives Sector: Considerations in Light of Covid-19* (Extractives Baraza, 2020).

Kosciulek D, *Strengthening Youth Participation in Climate-Related Policy Making* (South African Institute of International Affairs, December 2020).

Langer A, Ukiwo U & Mbabazi P (eds)., *Oil Wealth and Development in Uganda and Beyond: Prospects Opportunities and Challenges* (Leuven, Leuven University Press, 2020).

Malamatenios C, *Renewable Energy Sources: Jobs Created, Skills Required (And Identified Gaps), Education and Training*, (EDP Sciences, 2016).

Ministry of Finance (Uganda), *Uganda's Mineral and Mining Sub-Sector: What can be done to harness its full potential?* BMAU Briefing Paper (12/19) May 2019.

Ministry of ICT, Innovation and Youth Affairs State Department for Youth Affairs, *Kenya Youth Development Policy: Empowered Youth for Sustainable Development*, 2019.

NRGI, *Resource Governance Index: Tanzania* (2021)

PV-Magazine, *Solar can Energize the East African Recovery* <<https://www.pv-magazine.com/2021/03/22/solar-can-energize-the-east-african-recovery/>> accessed 9 November 2021.

Renner M, García-Baños C & Khalid A, *Renewable Energy and Jobs Annual Review*, (IRENA, 2019).

Tanzania Extractive Industries Transparency Initiative, *The 11th TEITI Report for the Period July 1 2018 to June 30 2019* (June 2021).

The Emergence of Solar Energy in East Africa <<https://strathmore.edu/news/the-emergence-of-solar-energy-in-east-africa/>> accessed 25 October 2021.

The International Hydropower Association (IHA), *Country profile: Tanzania* <<https://www.hydropower.org/country-profiles/tanzania>> accessed 16 November 2021.

The International Journal on Hydropower and Dams, *Country profile: Uganda* <<https://www.hydropower-dams.com/country-profiles/uganda/>> accessed 16 November 2021.

Uganda Investment Authority, *Uganda mining sector profile*, Undated.

- UNDP, *Extractive Industries and the Sustainable Development Goals* (OECD, Paris December 2, 2015).
- United Nations, *The World Youth Report: Youth and the 2030 Agenda for Sustainable Development* (Department of Economic and Social Affairs, 2018).
- United Nations, *Transforming Extractive Industries for Sustainable Development, (Policy –Brief May 2021).*
- Van der Ven, M J, *working paper: An overview of recent developments and the current state of the Ugandan energy sector, E-20046-UGA-1, June 2020.*
- Wabukala B et al, *Assessing wind energy development in Uganda: Opportunities and challenges* (Wind Engineering, 2021).
- World Bank, 'Extractives Industries' (2021) <<https://www.worldbank.org/en/topic/extractiveindustries/overview#1>> accessed 15 October 2021.
- Xunpeng (Roc) Shi, *The Energy Transition and Extractive Industries Development in the Asia-Pacific Region* (A United Nations Roundtable, February 4 2021).